113 年年會 海報論文展示：原著論文
目錄

原著論文 113_A1

高頻胸壁震盪儀與間歇性正壓呼吸應用於肺炎患者的有效性：一項回顧性研究

Investigating the Effectiveness of Combining High-Frequency Chest Wall Oscillation with Intermittent Positive Pressure Breathing in Pneumonia Patients: A Retrospective Cohort Study

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Background
Pneumonia represents a significant global health burden with high morbidity and mortality rates, despite advances in therapeutic and preventive strategies. Airway clearance techniques (ACT), including High-Frequency Chest Wall Oscillation (HFCWO) and Intermittent Positive Pressure Breathing (IPPB), are critical in managing respiratory conditions. However, the combined effectiveness of IPPB and HFCWO in treating adult pneumonia remains underexplored.

Methods
A retrospective cohort study was conducted at a college hospital in southern Taiwan, enrolling patients aged ≧18 years, admitted for pneumonia from January 2020 to December 2022, who received HFCWO therapy for ≧5 days in the ordinary ward. Exclusion criteria included prior mechanical ventilation before HFCWO initiation. Univariate and multivariable logistic regression models were used to assess the effectiveness of the combined use of IPPB and HFCWO.

Results
A total of 271 patients received HFCWO and were enrolled for analysis, including 163 patients who received both IPPB and HFCWO. Patients receiving both IPPB and HFCWO were associated with shortened total hospital stays (OR: 0.49, 95% CI: 0.28-0.83, p=0.008), decreased frequency of sputum suction (OR: 2.91, 95% CI: 1.46-5.78, p=0.002), and reduced oxygen need post-HFCWO (OR: 0.55, 95% CI: 0.33-0.91, p=0.021). However, there was no difference in hospital stay post-HFCWO use, respiratory failure, ICU admission, or hospital death between the groups. Additionally, there was no difference in these outcomes for patients who received HFCWO twice daily compared to those who received it once daily.

Conclusion
Combining IPPB and HFCWO reduces the need for sputum suction and improves oxygen demand for patients but does not change hospital days, respiratory failure, or mortality. Further large prospective cohort studies are necessary to confirm the efficacy of this management approach.

原著論文 113_A2

探討台灣不同地區綜合溫度熱指數與消化性潰瘍之關聯

Association between wet-bulb globe temperature with peptic ulcer disease in different geographic regions in a large Taiwanese population study

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Background

Peptic ulcer disease (PUD) is a common disease and remains an important cause of morbidity and influence the health care costs worldwide. The association of wet-bulb globe temperature (WBGT) and PUD has not been well understood. This study aimed to investigate the correlations of WBGT in different geographic regions of Taiwan with PUD, in a large cohort of participants, around 120,000, in the Taiwan Biobank (TWB).

Methods

The 120,424 enrolled participants from TWB were geographically distributed across four major areas of Taiwan: northern, central, southern and eastern regions. Self-reported PUD was obtained by questionnaires. The WBGT values were categorized into two distinct exposure windows: the working period, spanning from 8:00 AM to 5:00 PM, and the noon period, between 11:00 AM and 2:00 PM. For each participant, the average WBGT levels for 1, 3, and 5 years preceding the survey year of TWB were recorded.

Results

Multivariable analysis showed that, in northern Taiwan, the 1-year, and 5-year noon WBGT values per 1°C increase were significantly associated with low prevalence of PUD (odds ratio [OR], 0.960, p= 0.026 for 1year; OR, 0.962, p= 0.033 for 5years).In central Taiwan, whether it is noon period or working period, there is no significant difference between WBGT and PUD. In southern Taiwan, the 1-year, 3-year, and 5-year noon WBGT values per 1°C increase (OR, 0.875, p< 0.001 for 1 year; OR, 0.860, p< 0.001 for 3 years; OR, 0.848, p< 0.001 for 5 years).and work WBGT values per 1°C increase were significantly associated with low prevalence of PUD(OR, 0.852, p< 0.001 for 1 year; OR, 0.845, p< 0.001 for 3 years; OR, 0.832, p< 0.001 for 5 years).However, in eastern Taiwan, the 1-year, 3-year, and 5-year noon WBGT values per 1°C increase (OR, 1.074, p= 0.005 for 1 year; OR, 1.058, p= 0.011 for 3 years; OR, 1.058, p= 0.011 for 5 years), and the 3-year, and 5-year work WBGT values per 1°C increase were significantly associated with high prevalence of PUD (OR, 1.049, p= 0.037 for 3 year; OR, 1.047, p= 0.047 for 5 years).

Conclusion

Our results demonstrated that different association between WBGT values and PUD across different geographic regions in Taiwan. We found that in northern and southern Taiwan, average WBGT values increase were significantly associated with low prevalence of PUD. Also, the

relationship between increased WBGT values and low prevalence of PUD is much stronger in southern Taiwan comparing to the northern Taiwan. Interestingly, a reverse relationship between noon and working period of WBGT and PUD in eastern Taiwan can be seen. Further study may be conducted to find the WBGT effects on PUD.

原著論文 113_A3

洗腎患者發生心室早期收縮之危險因子

Risk factors for ventricular premature contraction in hemodialysis patients.

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Background

Ventricular premature contraction (VPC) is a type of ventricular arrhythmia that induces abnormal heartbeats in ventricles and might be triggered by Purkinje fibers and is closely associated with cardiomyopathy, heart failure, and cardiac death. For the purpose of early identification, our objective was to identify the risk factors associated with the development of VPCs in the hemodialysis patient population.

Methods

We designed a single-center, retrospective and observational cohort of hemodialysis patients in Taiwan. The study population included all hemodialysis patients undergoing 24-hour Holter electrocardiography (ECG) monitoring at Kaohsiung Medical University Hospital between April 30, 2009, and December 31, 2021. A total of 552 patients who underwent 24-hour Holter scans participated in this study.

Clinical characteristics included age, gender, comorbidities, medications and laboratory data. High VPC burden was defined as the number of daily VPCs greater than the population median. In contrast, low VPC refers to those whose daily VPC is less than the population median.

Baseline characteristics of categorical and numerical data were analyzed using chi-square tests and independent t-tests, respectively. Logistic regression was used to analyze the prediction of VPC outcomes. Statistical significance was defined as $p<0.05$.

Results

The average VPC burden in the study population is 10/day, so we define high VPC burden as >10/day (n = 273) and low VPC burden as ≦10/day (n = 279). Compared with the low VPC burden group, the high VPC burden group was older, more male, and had more comorbidities, including hypertension, coronary artery disease (CAD), and congestive heart failure (CHF). Laboratory data of the high VPC burden group showed higher white blood count (WBC), Ante Cibum (AC) glucose, parathyroid hormone (PTH), B-type natriuretic peptide (BNP), Troponin-I (TnI), cardiothoracic ratio (CTR). In comparison, laboratory data of cholesterol, high-density lipoprotein cholesterol (HDL), low-density lipoprotein cholesterol (LDL), urea reduction ratio (URR), Kt/V were lower in the high VPC group.

To further analyze the prediction of VPC outcomes in the hemodialysis group, logistic regression

analysis was performed. Risk factors that may increase the burden of VPC included older age (odd ratio (OR) 1.025, 95% confidence interval (CI) 1.011-1.04), male gender (OR 1.743, 95% CI 1.21-2.512), history of CAD (OR 1.902, 95% CI 1.21-2.991), WBC (OR 1.07, 95% CI 1. 013-1.131), glucose AC (OR 1.004, 95% CI 1.001-1.007), PTH (OR 1.001, 95% CI 1.0-1.001), BNP (OR 1.00016, 95% CI 1.000039-1.000029), TnI (OR 1.402, 95% CI 1.028-1.912) showed a higher risk of VPC burden. In contrast, cholesterol (OR 0.995, 95% CI 0.991-0.999), HDL (OR 0.978, 95% CI 0.965-0.991), LDL (OR 0.994, 95% CI 0.989-0.999), URR (OR 0. 05, 95% CI 0.004-0.644), Kt/V (OR 0.361, 95% CI 0.164-0.794) and calcium channel blockers (CCB) (OR 0.561, 95% CI 0.354-0.889) may reduce the risk of high VPC burden.
Previous studies have reported associations between high VPC burden and all-cause mortality and cardiomyopathy. Lin et al. suggested that a cut-off value of 12 VPCs per day could predict all-cause mortality [1]. A community-based study by Agarwal et al. recruiting 15792 patients also showed that the presence of VPCs increased the risk of subsequent heart failure [2]. In a Taiwanese population-based cohort study of 19,527 patients undergoing 24-hour Holter monitoring, VPC burden > 1000/day was associated with a high risk of cardiovascular death [3].

Conclusion

In our study, we focused on the hemodialysis population and tried to find the risk factor for high VPC burden. Among these patients, older age, male sex, history of CAD, and laboratory data (including WBC, glucose AC, PTH, BNP, TnI) showed a higher risk of VPC burden. This conclusion may help us to arrange relevant examinations for patients or refer patients to cardiology outpatient clinics as early as possible.

原著論文 113_A4

探討高血壓與慢性腎臟病中腦白質變化之間的關聯性

Exploring the Link between Hypertension and Cerebral White Matter Changes in Chronic Kidney Disease

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Background

Patients diagnosed with CKD are at a higher risk of encephalopathy, a condition exacerbated by the presence of various chronic diseases. Hypertension is a significant risk factor for brain damage in the general population but is limitedly discussed in patients with CKD. Brain MRI is an excellent tool for evaluating cerebral white matter lesions. Most previous studies showed the association between hypertension and cerebral white matter lesions in the general population but were less focused on CKD patients. Therefore, the present study aims to investigate the effect of hypertension on the cerebral white matter lesions of brain MRI in patients with CKD.

Methods

In this retrospective study, we enrolled 1,749 CKD patients who underwent brain MRIs to evaluate their brain lesions in Kaohsiung Medical University Hospital. The cerebral white matter hyperintensities on MRI were evaluated according to the Fazekas scale, including separate periventricular and deep white matter lesions from grade 0 to grade 3. The multivariable ordinal regression model was analyzed to determine the independent association between hypertension or blood pressure and cerebral white matter hyperintensities with adjustment of controlling age, sex, education, comorbidities (hyperlipidemia, cerebrovascular disease, chronic heart failure), laboratory data (hemoglobin, albumin, triglyceride, estimated glomerular filtration rate).

Results

Hypertension was associated with the Fazekas scale of periventricular lesions in multivariable-adjusted ordinal regression analysis (odds ratio [OR] 1.63, 95% confidence interval [CI] 1.15-2.30) after full adjustment. However, the hypertension comorbidities did not associate with the Fazekas scale of deep white matter lesions in the fully adjusted model (OR 1.24, 95% CI [0.89-1.75]). A positive association between blood pressure (per 10 mmHg increase) and the Fazekas scale was mainly on diastolic blood pressure rather than systolic blood pressure.

Conclusion

In CKD patients, hypertension was associated with brain white matter damage, in particular, Fazekas scale of periventricular lesions. Further study is needed to evaluate adequate blood pressure control to decrease the risk of brain damage in CKD patients.

原著論文 113_A5

使用長短期記憶機器學習模型預測血液透析患者腸道微菌的多樣性變化

Predicting Gut Microbiome Diversity Changes in Hemodialysis Patients using Long Short-Term Memory (LSTM) Machine Learning Model

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Background

Gut dysbiosis is common in patients with end-stage kidney disease (ESKD). Several clinical factors influence the microbial diversity in ESKD patients, such as comorbidities, clinical biochemistry, routine medications, and antibiotic exposures. Our study aims to predict changes in microbial diversity using a Long Short-Term Memory (LSTM) machine learning model, focusing on identifying key predictors among these factors.

Methods

A prospective cohort of 41 hemodialysis patients (mean age 58.1 ± 9 years) was followed from 2017 to 2020, with repeat stool samples collection. The stool microbiome was investigated using 16S rRNA gene amplicon sequencing. The microbial diversity changes were analyzed using the Shannon index difference between 2017 and 2020. All the information on demographics, comorbidities, clinical laboratory data, routine medications, and antibiotic exposure was recorded monthly from the electronic health record over 4 years study period. The LSTM model was employed to predict changes in microbiome diversity based on these factors.

Results

The Shannon diversity index decreased slightly over the follow-up period (-0.1 ± 0.2). The LSTM model identified antibiotics as key predictors of microbial diversity changes (validation Mean Absolute Error [MAE]: 0.107, root mean squared error [RMSE]: 0.131) rather than comorbidities, clinical biochemistry, or routine medications. Beta-lactam antibiotics were identified as the most important feature and demonstrated a significant association between beta-lactam exposure time and Shannon index changes ($p = 0.014$) after adjusting for age and sex, in regression analysis.

Conclusion

This study demonstrates that antibiotic exposure, as a major factor compared to other clinical factors, particularly beta-lactams, significantly influences gut microbiome diversity in hemodialysis patients. Our study illustrates that antibiotics are an important factor in the gut microbiome study and that gut microbiome health needs to be re-assessed carefully in hemodialysis patients.

原著論文 113_A6

腎功能在慢性腎臟病患中能預測腦部磁振造影周腦室白質病變

Renal Function Impairments predicts Periventricular White Matter Hyperintensities in Patients with Chronic Kidney Disease

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Background
Cognitive impairment is frequently observed in patients with chronic kidney disease (CKD), often worsening as kidney function declines. Decreased estimated glomerular filtration rate (eGFR) and increased albuminuria are key indicators of CKD progression, and both have been linked to cognitive deficits. Brain magnetic resonance imaging (MRI) is a valuable tool for detecting structural brain lesions, with white matter hyperintensities (WMHs) serving as markers of small vessel disease and predictors of cognitive decline. The Fazekas scale quantifies the severity of WMHs and highlights parenchymal changes seen on brain MRIs. This study aims to investigate the association between renal function, assessed by eGFR and albuminuria, and the severity of WMHs in CKD patients.

Methods
A cross-sectional analysis was conducted on 1,738 CKD patients with Brain MRI scans at Kaohsiung Medical University Hospital. Brain MRI scans were used to measure the severity of WMHs using the Fazekas scale, with distinct evaluations for periventricular WMHs (PWMHs) and deep WMHs (DWMHs). Renal function was assessed using eGFR calculated by the Modification of Diet in Renal Disease (MDRD) formula, while albuminuria was quantified by the urinary albumin-to-creatinine ratio (UACR), categorized into three stages with cutoff values at 30 mg/g and 300 mg/g. CKD severity was classified based on the 2024 KDIGO guidelines, incorporating both eGFR and albuminuria levels. Ordinal regression models, adjusted for potential confounders, were applied to analyze the relationship between kidney function and WMH severity.

Results
Renal function impairment, as indicated by reduced eGFR and increased UACR, was significantly associated with greater severity of PWMHs. Specifically, higher eGFR was associated with a reduction in PWMHs, with an ordinal odds ratio (OR) of 0.987 (95% confidence interval [CI]: 0.979-0.994, $p < 0.001$). Patients in UACR stage 3 exhibited a significant increase in PWMHs compared to those in UACR stage 1 (OR [95% CI]: 1.645 [1.066-2.540], $p = 0.024$). Additionally, patients classified as "very high-risk" by the KDIGO categories showed greater severity of PWMHs compared to those at low or moderate risk (OR [95% CI]: 1.832 [1.184-2.840], $p = 0.007$). However, there was no significant association between renal function indicators and the severity of DWMHs.

Conclusion
Our study demonstrates that renal function impairment, particularly reduced eGFR and elevated

UACR, is associated with increased severity of PWMHs in CKD patients. Our findings provide imaging evidence linking the relationship between CKD status and brain damage.

原著論文 113_A7

南台灣非酒精性脂肪肝(NAFLD)的流行病學趨勢及風險分析

Epidemiological Trends and Risk Analysis of NAFLD in Southern Taiwan

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Background

Non-alcoholic fatty liver disease (NAFLD) has gradually become the leading cause of chronic liver disease. In Taiwan, the prevalence of NAFLD is approximately 11.4-41% and shows an increasing trend. However, further evaluation regarding the characteristics and risk analysis of NAFLD in a community environment are needed. This study aims to explore the prevalence and risk factors of NAFLD in the southern Taiwan community.

Methods

The present retrospective study included subjects selected from community health screenings in southern Taiwan between 2001 and 2020. Each individual has undergone basic anthropometric measurements and biochemical tests during the assessment period. They also received ultrasound examinations to monitor the status of hepatic steatosis. To determine the presence or absence of NAFLD, multivariate analysis was used to test the independent relationships between the studied markers.

Results

A total of 6,096 subjects were enrolled in the study, and 3,004 (49.3%) subjects had NAFLD. Compared to the non-NAFLD group, patients with NAFLD are older, have a higher proportion of males, higher BMI and waist circumference values, a higher rate of diabetes, hypertension, hyperlipidemia, and elevated biochemical measurement levels. The prevalence of NAFLD was found to be 49.3%, with an increase from 46.3% in the 2001-2010 period to 55.7% in the 2011-2020 period. In the multivariate regression analysis, the significant factors influencing NAFLD included gender, BMI, waist circumference, diabetes, ALT, TG, TC, LDL-C, and the period (2001-2010 vs. 2011-2020). The NAFLD group was further stratified according to the severity of steatosis. We found that subjects with the moderate to severe NAFLD group were
mostly male, and had significant obesity, chronic diseases, elevated liver function index, and dyslipidemia. The proportion of individuals with moderate to severe NAFLD also increased from 40.2% in the first decade to 46.1% in the second decade.

Conclusion

Our study reveals a significant and growing NAFLD in the southern Taiwan community over 20 years. Emphasis should be placed on early detection, lifestyle modifications, and the management of associated risk factors such as obesity, diabetes, hypertension, and dyslipidemia to mitigate the progression and impact of NAFLD in the community.

原著論文 113_A8

更年期、停經後激素療法與台灣人口中消化性潰瘍疾病的關聯

Association between menopause, postmenopausal hormone therapy and peptic ulcer disease in Taiwanese population

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Background

Menopause in women is associated with various health conditions such as osteoporosis, cardiovascular issues, obesity, and psychological disorders. However, there's limited information on the relationship between perimenopause, hormone replacement therapy with the occurrence of digestive ulcers. Therefore, we conducted this population-based study of over 17,000 participants in the Taiwan Biobank (TWB) to examine the associations between menopause and peptic ulcer disease (PUD). In addition, we also examined the association between which type of menopause, postmenopausal hormone therapy and PUD.

Methods

Menopausal status, hormone replacement therapy during menopause, and the presence of PUD were determined using self-assessment questionnaires. Participants were grouped into menopausal and non-menopausal categories based on whether they had entered menopause. Additionally, participants were further categorized based on the cause of menopause: natural or surgical. Binary logistic regression was utilized for correlation analysis.

Results

A total of 17,460 cases were analyzed, 9620 individuals (55%) were in the menopausal group, while 7840 individuals (45%) were in the non-menopausal group. After adjusting for other factors, the menopausal group had a 1.19 times higher risk of developing PUD compared to the non-menopausal group (odds ratio [OR]: 1.19, 95% confidence interval [CI]: 1.03 to 1.38, $p = 0.022$). Moreover, surgical menopause was significantly associated with PUD (OR, 1.38; 95% CI, 1.16 to 1.63;

$p < 0.001$), but natural menopause was not (OR, 1.128; 95% CI, 0.96 to 1.30; $p = 0.153$). As for postmenopausal hormone replacement therapy, users of postmenopausal hormones had a significantly higher prevalence of PUD than non-users among the women with natural menopause (OR, 1.37; 95% CI, 1.11 to 1.70; $p = 0.004$). However, no significant association was found between postmenopausal hormone therapy and PUD among the women with surgical menopause ($p = 0.622$).

Conclusion

In conclusion, the study found that menopause was significantly associated with PUD. Furthermore, surgical menopause (vs. pre-menopause) was associated with 1.38 times risk of PUD, and in women with natural menopause, postmenopausal hormone therapy was associated with 1.37 times risk of PUD. Further research should develop deeper into the mechanisms and seek potential interventions to reduce the susceptibility of menopausal women with digestive ulcers.

原著論文 113_A9

照護點測試陰性結果不能排除登革熱-南部某醫學中心 2023 年登革熱大流行的診治經驗

A negative point-of-care result does not exclude dengue fever: the diagnostic experience of a medical center in southern Taiwan from the 2023 dengue outbreak

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Background

The dengue outbreak in 2023 has been the most severe after the 2014 and 2015 endemics in Taiwan. The accurate point-of-care tool is important for early diagnosis and to control dengue viral transmission during the outbreak. However, some dengue fever patients have negative NS1 (Non-structural protein 1) rapid antigen test results, leading to delayed recognition for dengue fever cases. Therefore, we launched this retrospective study to find out the differences between dengue fever patients with positive and negative NS1 rapid antigen test.

Methods

This is a retrospective medical record review study, enrolling the patients notified and finally confirmed as dengue fever by Taiwan Centers for Disease Control (CDC) at one medical center in southern Taiwan between January 2023 and December 2023. Patients with incomplete medical record were excluded. These patients were divided into NS1-negative and NS1-positive groups. The demographic characteristics, clinical presentation, laboratory finding and outcome were collected and analyzed.

Results

158 patients were identified and 22 patients (13.9%) were NS1-negative. Average age was 48 and 50 years old in NS1-negative and NS1-positive patients, respectively. In our study, we found NS1-negative patients had significantly fewer cases with warning signs compared to NS1-positive patients (22.7% vs. 49.3%, p=0.02). Interestingly, NS1-negative patients presented with more respiratory symptoms, including cough (31.8% vs. 27.2%, p=0.654) and sore throat (22.7% vs. 14.7%, p=0.339) while NS1-positive patients showed more gastrointestinal symptoms, such as abdominal pain (0% vs. 17.6%, p=0.027) and nausea/vomiting (13.6% vs. 33.8%, p=0.081). Besides, NS1-negative patients had significantly lower rate of hospitalization compared to NS1-positive patients (22.7% vs. 85.3%, p<0.001). This may be related to delayed diagnosis and notification due to negative NS1 antigen rapid test, which postponed further isolation, prevention and infection control.

Conclusion

This study suggests that dengue fever patients with negative NS1 antigen rapid test may present with less severe or atypical dengue symptoms compared to their NS1-positive counterparts.

Therefore, during the dengue outbreak, we should be alert to dengue fever even with negative NS1 antigen rapid tests.

原著論文 113_A10

病毒性肝炎對代謝功能障礙相關脂肪性肝病患者高血壓及糖尿病風險的影響

Impact of Viral Hepatitis on Risk of Hypertension and Diabetes Among Patients with Metabolic Dysfunction-associated Steatotic Liver Disease

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Background

Steatotic liver disease (SLD) is associated with higher risks of hypertension (HTN) and diabetes mellitus (DM). A new nomenclature of SLD, metabolic dysfunction-associated steatotic liver disease (MASLD) has emerged recently. Besides, Taiwan is hyperendemic for chronic hepatitis B (HBV) and hepatitis C (HCV) infections. The interaction between MASLD and viral hepatitis on risk of HTN and DM remains unclear. We adopted a retrospective cross-sectional and longitudinal cohort design to investigate the impact of viral hepatitis on risk of HTN and DM among MASLD patients with and without HBV and HCV.

Methods

The cross-sectional cohort consisted of 22,493 adults with SLD who underwent health checkups at a tertiary hospital in Taiwan from 1999 to 2013. Of which, 17,375 subjects with estimated glomerular filtration rate (eGFR) ≧30 mL/min/1.73 m^2, but without HTN and/or DM at baseline and within 1 year after enrollment were included as a longitudinal cohort. Both cohorts were divided into two groups, MASLD (SLD with at least one cardiometabolic risk factor [CMRF]) as the target group and simple SLD (SLD without CMRF) as the control group. The target group was further divided into three subgroups (NBNC-MASLD, HBV-MASLD, and HCV-MASLD), and the control group was further divided into simple non-B, non-C (NBNC)-SLD, simple HBV-SLD, and simple HCV-SLD.

Results

In the cross-sectional cohort, HBV-MASLD, but not HCV-MASLD, had significantly lower risk of existing-HTN (adjusted odds ratio [aOR]/95% confidence interval [CI] 0.85/0.77–0.94) compared to those with NBNC-MASLD. The prevalence of existing DM did not differ among HBV-MASLD, HCV-MASLD and NBNC-MASLD. In the longitudinal cohort, HCV-MASLD, but not HBV-MASLD, had significantly higher risks of new-onset HTN (adjusted hazard ratio [aHR]/95% CI: 1.46/1.12–1.92) and DM (aHR/95% CI: 1.81/1.22–2.68) than NBNC-MASLD. The new onset of HTN and DM did not differ among simple NBNC-SLD, simple HBV-SLD, and simple HCV-SLD patients.

Conclusion

Hepatitis C, but not hepatitis B infection increased the risk of new-onset hypertension and diabetes among MASLD patients.

原著論文 113_A11

台灣一大型追蹤研究發現長時間睡眠與良好睡眠品質可減少消化性潰瘍的發生率

Long sleep duration and good sleep quality reduced incident peptic ulcer disease in a large Taiwanese population follow-up study

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Background

Poor sleep has been associated with various diseases, including cardiovascular diseases, obesity and mental disorders. However, there is limited information on the correlation between sleep duration and quality with peptic ulcer disease (PUD). This study aims to investigate the impact of sleep duration and quality on the incidence of PUD in a large Taiwanese population follow-up study.

Methods

Our cases were sourced from the Taiwan Biobank. Sleep duration, sleep quality, and the presence of PUD were assessed using self-reported questionnaires. Participants were categorized into three groups based on sleep duration: less than 7 hours/day, 7 hours/day, and more than 7 hours/day. Sleep quality was divided into five levels: very poor, poor, normal, good and very good. The association between sleep duration and quality and incident PUD was analyzed using multiple logistic regression after controlling for confounders.

Results

We collected data from 22,561 participants (excluding those with pre-existing PUD, missing basic information, or lacking sleep data). Over an average follow-up period of 43 months, 1325 participants (5.9% of the study population) developed PUD. Multivariable analysis showed that the > 7 hours/day sleep duration group had a significantly less incidence of PUD (*vs.* less than 7 hours/day; hazard ratio [HR], 0.762; 95% confidence interval [CI], 0.660 to 0.879; $p < 0.001$). Furthermore, longer sleep duration was also significantly associated with less incident PUD (per 1 hour/day; HR, 0.930; 95% CI, 0.887 to 0.976; $p = 0.003$). Those with poor sleep quality (vs. very poor quality; HR, 0.643; 95% CI, 0.486 to 0.850; $p = 0.002$), normal sleep quality (vs. very poor quality; HR, 0.609; 95% CI, 0.468 to 0.792; $p < 0.001$), good sleep quality (vs. very poor quality; HR, 0.505; 95% CI, 0.381 to 0.669; $p < 0.001$), and very good sleep quality (vs. very poor quality; HR, 0.494; 95% CI, 0.368 to 0.664; $p < 0.001$) were significantly associated with incident PUD.

Conclusion

We found that longer sleep duration and better sleep quality are independent protective factors for PUD. Future research should further explore the underlying mechanisms and verify whether improving sleep can directly reduce the incidence of PUD.

原著論文 113_A12

以系統性回顧與統合分析於氣管支氣管狹窄或軟化之病人比較手術與非手術的治療效益

A systematic review and meta-analysis comparing surgical and non-surgical managements for tracheobronchial stenosis or malacia

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Background

The prognostic outcomes between surgery and non-surgery for tracheobronchial stenosis or malacia remains controversial. This study aimed to examine the effects of surgery and non-surgery for this population.

Methods

Comprehensive search was done for comparative studies regarding surgery and non-surgery for patients with tracheobronchial stenosis or malacia in four databases. We extracted events of success, mortality, respiratory failure, wound infection, pneumonia, longer-term survivor, and longer-term symptom relief. Outcome data was planned to be pooled using risk ratio in random-effects model, while Peto odds ratio (POR) was performed for outcomes with zero-cell. Heterogeneity was detected using I-square statistics. Effect size was presented with 95% confidence interval (CI).

Results

A total of 3227 references were identified, and seven (n=349) of them met eligibility criteria. The pooled findings showed that surgery and non-surgery exhibited non-significant differences in success rate, mortality, pneumonia, and wound infection. Although surgery led to higher respiratory failure rate (POR, 5.86; 95% CI, 1.44 to 23.89; I-square, 0%), it resulted in better longer-term survival rate (POR, 3.54; 95% CI, 1.12 to 11.15; I-square, 39%) and longer-term symptom relief rate (POR, 3.50; 95% CI, 1.55 to 7.89; I-square, 60%) as compared with non-surgery.

Conclusion

Surgery and non-surgery appear to be comparable in treating patients with tracheobronchial stenosis or malacia although surgery might result in better outcomes in longer-term. It is better to tailor surgical management according to type, location, severity, and etiology of stenosis. If patients can tolerate surgical risk, surgery is still a good choice.

原著論文 113_A13

生成式人工智慧在臨床腎臟科中的初步評估：ChatGPT-4、Gemini Pro 和 Bard 在患者互動與解讀腎臟切片的表現評估

Preliminary Evaluation of Generative AI Assistance in Clinical Nephrology: Assessing ChatGPT-4, Gemini Pro, and Bard in Patient Interaction and Renal Biopsy Interpretation

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Background

Taiwan, a digitally advanced nation with a 90.7% internet penetration rate as of early 2023, faces challenges in public health communication despite widespread access to online health information. Many patients struggle to interpret complex medical data due to limited medical knowledge, leading to confusion and misunderstandings. While hospitals provide health education online, the content often remains too technical for the general public. The Taiwan National Health Insurance Administration's pre-End Stage Kidney Disease (pre-ESKD) program, launched in 2006, has raised awareness about kidney health, yet many renal patients still find it difficult to understand health information on websites. To address this gap, Generation AI technology, introduced in 2022, offers a promising solution by providing personalized and accessible explanations. This study evaluates the effectiveness of AI models—ChatGPT-4, Gemini Pro, and Bard—in assisting with nephrology-related inquiries, particularly in outpatient settings, and their ability to explain renal biopsy reports to patients and families.

Methods

This study was conducted at a medical center in central Taiwan aiming to integrate AI technologies into renal clinical settings. Researchers selected 21 nephrology-related questions and 3 renal biopsy reports to evaluate the performance of three AI platforms: ChatGPT-4, Gemini Pro, and Bard. The questions covered dialysis, kidney examinations, and general kidney-related issues, while the biopsy reports focused on IgA nephropathy, focal segmental glomerulosclerosis, and membranous nephropathy.

From December 8 to December 12, 2023, IT engineers inputted each question and report into the AI platforms three times to assess response consistency. The AI-generated responses were then anonymized and evaluated by four experienced nephrologists using a 4-point scale, focusing on appropriateness, helpfulness, consistency, and human-like empathy.

Data analysis included mean, standard deviation calculations, and an ANOVA test to identify significant differences among the AI models. Advanced analytical tools like TF-IDF, BertScore, and ROUGE were employed to measure the performance of the AI models in generating consistent and relevant responses. The evaluation process was double-blind to ensure unbiased results.

Results

ChatGPT-4 achieved an average score of 2.68±0.94 in appropriateness, 2.58±0.91 in helpfulness, and 3.36±0.78 in consistency, showing slight advantages in these areas. Gemini Pro demonstrated

consistent performance with scores of 2.58±0.86 in appropriateness, 2.59±0.83 in helpfulness, and 3.40±0.78 in consistency. Bard scored slightly lower in appropriateness (2.53±0.85) and helpfulness (2.54±0.88) but remained competitive in consistency (3.30±0.87). In human-like empathy, ChatGPT-4 led with a score of 79.86%. Statistical analysis using ANOVA revealed no significant differences in overall performance except for specific questions (Q19 and Q23). Reference accuracy by ChatGPT-4 was 100%.

Conclusion

Our study indicates that while generative AI models like ChatGPT-4, Gemini Pro, and Bard show promise in supporting clinical renal services, they should be viewed as supplementary tools rather than replacements for professional medical advice. These AI models can enhance patient communication and education in nephrology, but their integration requires careful oversight, continuous validation, and recognition of their limitations. Healthcare providers must verify and contextualize AI-generated information within the broader scope of medical expertise. As AI technology advances, ensuring patient safety and maintaining the quality of care should remain the top priority.

原著論文 113_A14

修格蘭氏症候群與白斑顯著相關

Sjögren's Syndrome is Associated with an Increased Risk of Vitiligo

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Background
Limited studies reported the correlation between Sjögren's syndrome (SS) and vitiligo. This study explores the association between SS and the risk of developing vitiligo and assesses comorbidity profiles and medication impacts.

Methods
We conducted a retrospective, population-based analysis using data from Taiwan's National Health Insurance Research Database, spanning 2008 to 2019. The primary outcome was the incidence of vitiligo, which was analyzed using Cox proportional hazards models, with additional subgroup and sensitivity analyses conducted.

Results
The study incorporated 266,292 individuals with SS and 19,466,177 controls. 266,292 pairs of the SS and controls were analyzed following propensity score matching. Individuals with SS had a 2.39-fold increased risk of developing vitiligo compared to those without SS (95% confidence interval [CI], 2.11–2.71; P<0.001). Age-related risk was evident, particularly in those aged 40–59 and 60–79. Males had a lower risk of vitiligo than females. Comorbidities such as hyperlipidemia, chronic liver disease, hyperthyroidism, and systemic lupus erythematosus further increased the risk. Over a decade of follow-up, the SS cohort demonstrated a significantly increased cumulative risk of vitiligo compared to the non-SS cohort (log-rank P <0.001). During the first-year post-diagnosis, individuals with SS had a significantly higher risk of developing vitiligo compared to those without SS (adjusted hazard ratio [aHR], 3.75; 95% CI, 2.66–5.29; P<0.001). This elevated risk persisted beyond five years of follow-up (aHR, 2.17; 95% CI, 1.75–2.68; P <0.001). Systemic corticosteroids were associated with a reduced risk of vitiligo (adjusted hazard ratio, 0.5; 95% CI, 0.44–0.56; P < 0.001), while hydroxychloroquine was linked to an increased risk (adjusted hazard ratio, 1.41; 95% CI, 1.16–1.72; P < 0.001). While the risk was not prominent if prolonged use of HCQ for more than 365 days (aHR, 1.05; 95% CI, 0.72–1.53; P = 0.8105)

Conclusion
SS is significantly associated with an increased risk of developing vitiligo. Further research is warranted to elucidate the underlying mechanisms.

原著論文 113_A15

當腺病毒不再溫順：一個生命的啟示

A Fatal Pneumonia in An Adult Associated with Adenovirus

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Background

Adenovirus (AdV) infections mainly affect children, whereas adults in crowded places are also at risk. While most AdV infections are mild and self-limiting, they can occasionally lead to severe pneumonia and even death. The fatality rate for untreated severe AdV pneumonia or disseminated disease may exceed 50%. In severe cases, AdV infection can rapidly progress to multiorgan failure and death. However, only a limited number of cases have been reported.

Methods

A 34-year-old male with a history of persistent depressive disorder, class II obesity (BMI > 40), and no prior systemic illnesses was transferred to the emergency department (ED) due to acute respiratory distress syndrome (ARDS) requiring extracorporeal membrane oxygenation (ECMO). His symptoms began with fever and a productive cough, progressing to severe community-acquired pneumonia and bilateral lung opacities, unresponsive to initial treatment. Despite aggressive management, his respiratory distress worsened, leading to intubation and transfer to the intensive care unit with severe ARDS.

Upon arrival at the ED, the patient was critically ill, with severe hypoxemia, high blood pressure, tachycardia, and hyperthermia. Due to the unavailability of ECMO, the patient's family opted to transfer him to another facility against medical advice. En route, the patient experienced out-of-hospital cardiac arrest and was redirected to our ED. After out-of-hospital cardiac arrest and successful resuscitation, veno-venous ECMO was initiated, and broad-spectrum antibiotics were administered. Adenovirus was identified as the causative pathogen. Due to a suspected cytokine storm, immunoglobulin and hydrocortisone were given. The patient's condition deteriorated with refractory hypoxemia, necessitating veno-arterial-venous ECMO.

Complications included carbapenem-resistant Acinetobacter baumannii (CRAB) ventilator-associated pneumonia, managed with targeted antibiotics, and multiple blood transfusions due to ECMO-associated bleeding. The patient experienced another episode of cardiac arrest due to arrhythmia and ECMO malfunction but was successfully resuscitated. Imaging revealed acute hypoxic-ischemic encephalopathy and possible cerebral infarctions, leading the family to opt for palliative care. The patient succumbed to a third cardiac arrest, with the final diagnosis being severe AdV pneumonia with multi-organ dysfunction. Postmortem findings confirmed AdV in stool culture.

Results

Fatal AdV pneumonia is a severe respiratory disease that impacts susceptible populations, including otherwise healthy young adults. However, even with the help of ECMO, which is thought to enhance the outcomes, the mortality stays considerable, with approximately 57% of

immunocompetent adults needing ventilatory support dying of complications. Furthermore, AdV-associated ARDS is characterized by a rapid course of development, accompanied by multi-organ dysfunction and mortality. Molecular analysis may be useful in determining the specific strain and treatment response, as there are limited treatments available; cidofovir is currently the preferred treatment, especially in ECMO patients, although ribavirin is not very effective in some cases. The high rate of disease progression highlights the importance of developing antiviral therapies.

Conclusion

Adenovirus may be an unrecognized cause of fatal pneumonia. Cidofovir has been reported to have some effectiveness in treating AdV pneumonia, especially when the patient experiences severe disease and ARDS. Adenovirus should be ruled in any case of severe pneumonia, irrespective of the patient's immune state.

原著論文 113_A16

GLP-1RA 與 TZD 合併治療於第二型糖尿病患者的死亡和心血管結果分析

The Combination Use of Glucagon-Like Peptide-1 Receptor Agonist and Thiazolidinedione for Mortality and Cardiovascular Outcomes in Patients with Type 2 Diabetes: A Nationwide Comparative Study

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Objective
To compare the hazards of cardiovascular-related morbidities and mortality between patients with type 2 diabetes receiving combination therapy with GLP-1RA/TZD, monotherapy with GLP-1RA or TZD, and non-users.

Methods
This retrospective cohort study utilized nationwide data from Taiwan's National Health Insurance Research Database. Patients with type 2 diabetes receiving GLP-1RA or TZD between 2009 and 2019 in Taiwan were enrolled. This target trial design investigates the hazards of all-cause mortality, major adverse cardiovascular events, cardiovascular mortality, cardiovascular complications, and hypoglycemia in the GLP-1RA and TZD users.

Results
In total, 47526 GLP-1RA users, 32203 TZD users, and 30682 GLP-1RA/TZD users were included. Patients receiving GLP-1RA/TZD had significantly lower hazards of developing all-cause mortality (adjusted hazard ratio, 0.20; 95% CI, 0.19–0.21; $p < 0.001$), major adverse cardiovascular events (adjusted hazard ratio, 0.85; 95% CI, 0.82–0.89; $p < 0.001$), and cardiovascular mortality (adjusted hazard ratio, 0.20; 95% CI, 0.18–0.232; $p < 0.001$) than those did not receive GLP-1RA nor TZD. However, GLP-1RA/TZD combination therapy led to a higher risk of hypoglycemia (adjusted hazard ratio, 1.61; 95% CI, 1.43–1.82; $p < 0.001$) compared with control, especially TZD, rather than GLP-1RA. The risk was mitigated in prolonged use. We found significantly lower cumulative incidences of ACM and CVM in GLP-1RA, TZD, and combined users than non-users (log-rank $p < 0.001$). Several sensitivity analyses further supported the robustness of our findings.

Conclusion
Combination therapy with GLP-1RA and TZD was associated with significantly lower hazards of mortality and cardiovascular complications than non-use in patients with type 2 diabetes. GLP-1RA could mitigate the adverse effects of TZD on the cardiovascular system.

原著論文 113_A17

困難梭狀桿菌治療的療效與安全性：隨機對照試驗的系統性回顧與網絡統合分析

Management of Clostridium Difficile Infection: A Systemic Review and Network Meta-analysis of Randomized Controlled Trials

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Background

To evaluate and compare the efficacy and safety of vancomycin, fidaxomicin, ridinilazole, and fecal microbiota transplantation (FMT) in the treatment of Clostridium difficile infections (CDIs).

Methods

A systematic literature review was conducted in September 2024 to assess the efficacy and safety of vancomycin, fidaxomicin, and ridinilazole for treating CDIs, as well as the role of FMT in managing recurrent cases. Data were extracted from comparative studies, and ridinilazole was assessed through indirect comparisons based on studies evaluating vancomycin and ridinilazole. The analysis included network meta-analysis, focusing on clinical cure rates, recurrence rates, and adverse event profiles. FMT was reviewed based on its role in recurrent CDI management.

Results

Fidaxomicin exhibited the highest efficacy in preventing CDI recurrence, with a 40-day recurrence rate reduction (RR = 0.52) and a 60-day recurrence rate reduction (RR = 0.38) compared to vancomycin. The odds ratio (OR) for clinical cure with fidaxomicin compared to vancomycin was 1.25 (95% confidence interval: 0.90, 1.75), while its recurrence rate was significantly lower [OR: 0.45 (0.32, 0.62)]. Ridinilazole showed comparable efficacy to vancomycin for clinical cure [OR: 1.03 (0.88, 1.20)] but had a trend toward lower recurrence rates [OR: 0.75 (0.55, 1.05)]. Fidaxomicin also outperformed ridinilazole in preventing recurrences [OR: 0.60 (0.38, 0.95)], highlighting its superiority in reducing recurrence risk. FMT showed a clinical success rate exceeding 90% for recurrent CDI, especially in cases of multiple recurrences, and is recommended as an effective intervention for such patients. Regarding safety, fidaxomicin had the most favorable profile, with fewer adverse events compared to vancomycin and ridinilazole. Vancomycin was generally well-tolerated, while ridinilazole had a higher incidence of gastrointestinal side effects. FMT, while highly effective, carries risks related to donor screening and procedural complications.

Conclusion

Fidaxomicin demonstrated superior efficacy and safety in treating CDI, particularly in preventing recurrences, and should be considered as a first-line therapy. Vancomycin and ridinilazole showed similar efficacy for clinical cure, with vancomycin having a more favorable safety profile than ridinilazole. FMT remains the most effective treatment for recurrent CDI, offering a higher success rate but with specific safety considerations. Each treatment should be tailored to the patient's clinical history and recurrence risk.

原著論文 113_A18

針對持續性心房顫動使用改良式肺靜脈隔離合併左心房後壁消融術的單一醫學中心回溯性研究

A single-center retrospective study of modified pulmonary vein isolation with posterior line ablation for persitent atrial fibrillation

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Background

Percutaneous catheter ablation is an effective treatment for paroxysmal atrial fibrillation(AF), particularly in cases that are refractory to antiarrhythmic medications. Nonetheless, catheter ablation for persistent AF is more challenging and is associated with less favorable outcomes. Meta-analyses had reported a single procedure success for catheter ablation for persistent AF ranging from 43% to 67%. Different techniques and optimal ablation strategies are emerging to improve outcomes. We introduce the broaden pulmonary vein isolation with extra posterior line ablation (Hand-Cuff method) for persistent AF to result in better free of recurrent AF.

Methods

We retrospectively collected data covering the period from January 2019 to July 2023. A total of 354 patients with AF were admitted for ablation. Among them, 64 had persistent AF, and 12 had longstanding persistent AF. Of these 76 patients, 62 (81.6%) underwent their first catheter ablation, 9 (11.8%) received cryoablation, 4 (5.2%) had previously undergone AF catheter ablation, and 1 (1.3%) was found to have a left atrial appendage thrombus preoperatively and did not undergo ablation.

Among the 62 patients receiving their first catheter ablation, 32 (51.6%) underwent pulmonary vein isolation (PVI) plus extra ablation line or not which is depended on operator(Group A), while 30 (48.4%) underwent modified broaden PVI with extra posterior line ablation(Hand-cuff method,Group B). Both groups were followed up for one year to monitor heart rhythm outcomes, observing whether the patients remained in atrial fibrillation or reverted to sinus rhythm.

Results

After excluding cases lost to follow-up, 24 patients from Group A were included in the analysis, of which 10 (41.6%) remained in sinus rhythm one year post ablation. In Group B, 23 patients were included, with 18 (78.2%) maintaining sinus rhythm one year later. The p-value was 0.011, indicating statistical significance.

When excluding patients with longstanding persistent AF, 56% of Group A patients remained in sinus rhythm one year after ablation, compared to 79% in Group B.

The limitations of our study include a small sample size, a relatively short follow-up period, operator preferences and techniques, as well as the methods used to monitor heart rhythm.

Conclusion

The new Hand-Cuff method with broaden pumonary vein isolation with posterior linear ablation results in better free of recurrent atrial fibrillation during first year follow-up for patients with

persistent AF. We still need more rigorous inclusion criteria, larger randomized studies, and longer follow-up periods to better assess the effectiveness of this new approach.

原著論文 113_A19

開發微小核糖核酸奈米複合物之外用藥膏以加速糖尿病傷口癒合

Development of microRNA nanocomplex topical ointment to accelerate diabetic wound healing

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Background

The poor-healing characteristic of diabetic foot ulcer (DFU) is attributed to multiple factors, including neuropathy, infection, peripheral artery occlusive disease and trauma. Our laboratory previously reported that local injections of lipofectamine-mixed miR-146a-5p and miR-200b-3p had pro-healing properties of diabetic wound in db/db mice, with a better pro-healing efficacy of miR-200b-3p than miR-146a-5p. However, patients with DFUs have larger wound areas than the mouse wound healing model and local injections in the wounds of DFU require multiple needle punctures that can be quite traumatic, painful and not realistic in the clinical practice. In this study, we investigated whether the local application of lipofectamine/microRNA nanocomplexes using poloxamer 407 hydrogel (gel) accelerates diabetic wound healing in db/db diabetic mice.

Methods

Twelve-week-old male db/db mice were used in the experiments. The mice were anesthetized by isoflurane inhalation. After careful sterilization, two dorsal full-thickness wounds were created in each mouse using an 8-mm punch biopsy (Miltex Inc) on the left and right back on the 0th day. Immediately after surgery, 100 μl different gel formulations (gel alone, gel/100 ng miR-negative control/lipofectamine™ 3000 (miR-NC), gel/100 ng miR-146a-5p/lipofectamine™ 3000 (miR-146a-5p) and gel/100 ng miR-200b-3p/lipofectamine™ 3000 (miR-200b-3p) were topically applied on each wound. The wounds underwent gel change every two days until the end of study. At the 14th day, all mice were euthanized by CO2 narcosis. Full-thickness skin samples were harvested from all wounded areas on the 14th day after surgery for real-time PCR, H&E staining, and immunohistochemistry examination. Photographs were obtained every two days from the 0th day to the 8th day and obtained daily from the 9th day to the 14th day. ImageJ software was used to calculate the wound area of each mouse.

Results

All db/db mice gradually lost their weight due to the hypercatabolic status of wound healing process. However, the mean percent body weight reduction between the 0th day to 14th day was most significant in the gel group (-10.17%), followed by miR-NC group (-8.48%), miR-146a-5p group (-8.05%) and miR-200b-3p group (-6.47%). At the 14th day, miR-200b group showed the better wound healing and higher granulation tissue thickness than the other three groups. MiR-200b-3p group showed a significant decrease of IL-6 gene expression, as compared to miR-NC group. The Col1α2/Col3α1 ratio, a measure of remodeling characteristics, was increased in both miR-146a-5p and miR-200b-3p groups, as compared to miR-NC group. Immunohistochemistry staining found that immunoreactivities of CD68 were significantly decreased in both miR-146a-5p and miR-200b-3p groups, as compared to miR-NC group. Besides, the immunoreactivities of CD31 were

significantly increased in miR-200b-3p group, as compared to miR-146a-5p group. These data suggested that miR-200b-3p possesses a better pro-healing efficacy than miR-146a-5p, an effect that was partially caused by the higher anti-inflammatory and pro-angiogenic effects of miR-200a-3p than miR-146a-5p.

Conclusion

Topical application of miR-200b-3p nanocomplexes using poloxamer 407 hydrogel shows a more promising result in accelerating diabetic wound healing than miR-146a-5p nanocomplexes. These data provide the proof of concept that local application of microRNA formulation is a feasible and effective approach for diabetic wound management.

原著論文 113_A20

長鏈非編碼核糖核酸 EGOT 在缺氧腎小管細胞藉由調控 Parkin 和 PGC-1α來影響粒線體自噬與粒線體生成

LncRNA EGOT regulates mitophagy and mitochondria biogenesis through Parkin and PGC-1α in renal tubular cells under hypoxia conditions

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Background

Ischemia/reperfusion injury, a common cause of AKI, results from a localized or generalized impairment of nutrient and oxygen delivery to, and waste product removal from cells. The mechanisms of ischemic kidney injury need to be further investigated. lncRNAs is involved in the pathogenesis of many diseases. Mitochondria turnover is an integral aspect for maintaining mitochondrial quality. Mitophagy, a kind of selective autophagy, is to sequester damaged mitochondria and prevents subsequent ROS release and cell death. Through this process, dysfunctional mitochondria is selectively eliminated and replaced by a new mitochondria (biogenesis). Mitochondria biogenesis is important for the repair of acute kidney injury. We hypothesize that lncRNA could regulate the mitophagy and mitochondria biogenesis in human renal proximal tubular cells, HK2 cells, under hypoxia conditions.

Methods

Bioinformatics, and real-time PCR are used to identify the candidate lncRNA EGOT. Overexpression and knockdown lncRNA-EGOT were evaluated. Mitophagy proteins (PINK1, p-PARKIN, BNIP3, LC3), mitochondria dynamics, biogenesis, and apoptosis related proteins (Drp-1, MFN-1, PGC-1α, Caspase 3) were determined through western blot analysis. Immunofluorescence studies of p-PARKIN and LC3/TOMM20 colocalization were determined using confocal analysis.

Results

Hypoxia upregulated mitophagy proteins, mitochondria fission and biogenesis related proteins expressions, and mitophagosome in HK-2 cells.

LncRNA EGOT expression was also significantly downregulated in renal tubular cells during hypoxia condition. Overexpression studies of hypoxia-regulated lncRNA- EGOT significantly downregulated p-Parkin, Parkin, LC3II expression, and LC puncta mitophagosome formation, while EGOT knockdown reversed the suppression of mitophagy. In addition, overexpression of lncRNA EGOT could significantly downregulated mitochondria biogenesis through suppressing the expression of mitochondria biogenesis related proteins, PGC1α, and promotes apoptosis.

Conclusion

LncRNA EGOT could regulate mitophagy, and mitochondria biogenesis, and promote apoptosis through suppressing the expression of Parkin and PGC1α in HK2 cells under hypoxia condition.

原著論文 113_A21

持續肝動脈化學栓塞術對接受第一線酪氨酸激酶抑制劑治療的中期肝細胞癌患者生存結果的影響

The impact of continuing transarterial chemoembolization (TACE) on survival outcomes in patients with intermediate-stage hepatocellular carcinoma (HCC) treated with first-line tyrosine kinase inhibitors (TKIs)

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Background

Patients with intermediate-stage hepatocellular carcinoma (HCC) who are refractory to TACE are typically advised to begin first-line treatment with tyrosine kinase inhibitors (TKIs). This study investigated the impact and role of on-demand transarterial chemoembolization (TACE) on survival outcomes for these patients.

Methods

Patients with Barcelona Clinic Liver Cancer (BCLC) stage B HCC who underwent treatment with sorafenib or lenvatinib between February 2020 and January 2023 at China Medical University Hospital were retrospectively evaluated and included in this study. These patients also had both complete medical records and follow-up data available. Patients were divided based on the up-to-7 criteria for tumor burden classification. Overall survival (OS) and progression-free survival (PFS) were calculated from the date of TKI initiation. Survival data were compared using log-rank tests, and associations between patient characteristics and survival were estimated using Cox regression models.

Results

A total of 47 HCC patients who were refractory to TACE from the original first-line TKI cohort (n = 134) were included. Of them, 22 patients continued to receive on-demand TACE after initiating TKIs. Thirty-seven cases progressed (78.7%) and 11 deaths (23.4%) were recorded during a median follow-up of 16 months (range: 3–40 months). The median OS from the time of TKI initiation was not reached, with a median PFS of 5 months (95% CI, 3.1–6.9 months). Patients were divided into two subgroups based on the tumor burden (up-to-7 criteria) and TACE usage. The median PFS was significantly longer (7 months, 95% CI: 0–15.3) in the within up-to-7 criteria group (n=30) compared with those (4 months, 95% CI: 3–4.9) in the beyond up-to-7 criteria group (n=17) (p = 0.005). The median OS was significantly longer (not reached) in the within up-to-7 criteria group compared with those (21 months, 95% CI: 7.6–34.4) in the beyond up-to-7 criteria group (p < 0.001). TACE significantly improved PFS in the within up-to-7 criteria group (n=15), with a median PFS of 16 months (95% CI: 0–15.3). However, TACE did not confer the same survival benefit to the beyond up-to-7 criteria group (n=7). Multivariate Cox regression analysis showed that the combination of being within up-to-7 criteria and receiving TACE was a significant factor for improved PFS (HR: 0.340, 95% CI: 0.137–0.841), but it was not a significant factor for OS.

Conclusion

Up-to-7 criteria could predict progression-free survival and overall survival in TKI-treated patients with intermediate stage HCC refractory to TACE. TACE improved PFS but not OS in those who were within the Up-to-7 criteria. Prospective studies are warranted.

原著論文 113_A22

PM2.5 暴露對罹患自體免疫疾病風險影響的世代研究

Effect of PM2.5 exposure on the risk of developing autoimmune diseases: a prospective cohort study in Taiwan

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Background

The interaction between fine particulate matter (PM2.5) and genes plays a significant role in the development of autoimmune diseases. However, the effect of PM2.5 on autoimmune disease onset is unclear. The aim of this population-based cohort study was to investigate the effect of year-to-year variations in PM2.5 exposure levels on incident autoimmune disease risk in Taiwanese adults.

Methods

In this longitudinal study, we followed-up 267,722 adults from the Taiwan MJ cohort (2005–2017) for 9.8 years to identify incident autoimmune diseases cases, ascertained from the patients' clinical and laboratory reports. Autoimmune diseases were categorized as systemic and organ-specific. Data on residential address-specific annual PM2.5 concentrations were obtained from Taiwan Air Quality-Monitoring sites. A time-dependent Cox regression model, considering death as a competing risk, was used to assess the effect of year-to-year variations in PM2.5 exposure levels on autoimmune disease risk.

Results

During the 2,615,166 person-years of follow-up, new-onset autoimmune diseases were observed in 1,231 (0.46%) individuals, corresponding to an incident rate of 47.07 per 100,000 person-years. Participants with high PM2.5 exposure levels (per 5-μg/m^3 increase) had a significantly increased risk of incident autoimmune diseases (adjusted hazard ratio [aHR], 1.86; 95% confidence interval [CI], 1.76–1.98), particularly systemic lupus erythematosus (SLE) (aHR, 3.10; 95% CI, 2.76–3.48) and Sjögren's syndrome (aHR, 2.51; 95% CI, 2.33–2.70).

Conclusion

Proactive air pollution control strategies are crucial for the prevention of autoimmune diseases, particularly SLE and Sjögren's syndrome.

原著論文 113_A23

比較以 vonoprazan 為基礎與以 lansoprazole 為基礎的多種處方在幽門桿菌一線治療中的療效-多中心、開放標籤、隨機試驗

Comparison of vonoprazan-based versus lansoprazole-based regimens in the first-line treatment of Helicobacter pylori infection - a multicenter, open labelled, randomized pilot trial

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Background

With the increasing prevalence of antibiotic resistance in *Helicobacter pylori* (*H. pylori*) infection, the eradication rates of empirical triple therapy have decreased. Vonoprazan, a potassium-competitive acid blocker (PCAB), is known to have a superior effect on inhibiting gastric acid secretion compared to traditional proton pump inhibitors (PPIs). We conducted a randomized pilot trial to compare the efficacy of 14-day vonoprazan-based dual therapy, triple therapy, bismuth quadruple therapy, and hybrid therapy in the first-line *H. pylori* treatment to that of 14-day lansoprazole-based bismuth quadruple therapy and triple therapy.

Methods

Using a block randomization with a block size of 16 in a 1:1 ratio, 320 eligible adult subjects aged 20 years or greater with at least two positive tests for *H. pylori* infection were randomized to receive one of the following regimens: (A) vonoprazan-based triple therapy for 14 days (T-V14) ; or (B) vonoprazan-based triple therapy for 7 days (T-V7); or (C): vonoprazan-based dual therapy for 14 days (D-V14); (D): vonoprazan-based high dose dual therapy for 14 days (HD-V14); or (E) vonoprazan-based bismuth quadruple therapy for 14 days (BQ-V14); or (F) vonoprazan-based reverse hybrid therapy for 14 days (RH-V14); or (G) lansoprazole-based bismuth quadruple therapy for 14 days (BQ-L14); or (H) lansoprazole-based triple therapy for 14 days (T-L14). The 13Carbon urea breath test was conducted at least six to eight weeks after treatment to assess eradication efficacy. The primary outcome was the eradication rate in first-line treatment. The secondary outcomes are compliance, frequency of adverse events, and long-term metabolic effects.

Results

Among 320 treatment-naïve *H. pylori*-infected patients who were randomly assigned and underwent post-eradication evaluation, the eradication rates in the intention-to-treat (ITT) and the per-protocol (PP) analyses were as follows: the 14-day vonoprazan-based triple therapy group achieved eradication rates of 90.0% (95% CI: 76.3%-97.2%) in ITT versus 89.5% (95% CI: 75.2%-97.1%) in PP; the 7-day vonoprazan-based triple therapy group had rates of 85.0% (95% CI: 70.2%-94.3%) in ITT versus 87.2% (95% CI: 72.6%-95.7%) in PP; the 14-day vonoprazan-based dual therapy group showed rates of 87.5% (95% CI: 73.2%-95.8%) in ITT versus 92.1% (95% CI: 78.6%-98.3%) in PP; the 14-day vonoprazan-based high-dose dual therapy group recorded rates of 87.5% (95% CI: 73.2%-95.8%) in ITT versus 91.9% (95% CI: 78.1%-98.3%) in PP; the 14-day vonoprazan-based bismuth quadruple therapy group had rates of 95.0% (95% CI: 83.1%-99.4%) in ITT versus 97.4% (95% CI: 86.5%-99.9%) in PP; the 14-day vonoprazan-based reverse hybrid therapy group

achieved rates of 92.5% (95% CI: 79.6%-98.4%) in ITT versus 97.4% (95% CI: 86.2%-99.9%) in PP; the 14-day lansoprazole-based bismuth quadruple therapy group showed rates of 92.5% (95% CI: 79.6%-98.4%) in ITT versus 100% (95% CI: 90.6%-100.0%) in PP; and the 14-day lansoprazole-based triple therapy group had consistent rates of 82.5% (95% CI: 67.2%-92.7%) in both ITT and PP analyses. Additionally, the overall percentages of adverse effects in these eight groups were 27.5%, 17.5%, 22.5%, 27.5%, 42.5%, 32.5%, 67.5%, and 17.5%, respectively.

Conclusion

The eradication rates for vonoprazan-based quadruple therapies and lansoprazole-based bismuth quadruple therapy exceeded 97% in the PP analysis, with the highest risk of adverse effects observed in the lansoprazole-based bismuth quadruple therapy group (67.5%). The vonoprazan-based dual therapy demonstrated good eradication efficacy (92.1%, 91.9%) and fewer adverse effects, making it a viable alternative for first-line empirical therapy, especially in the context of increasing clarithromycin resistance. The 14-day vonoprazan-based triple therapy was more effective than both the 7-day vonoprazan-based triple therapy and the 14-day lansoprazole-based triple therapy. However, these therapies need to be evaluated comprehensively, considering efficacy, side effects, treatment cost, and long-term safety.

原著論文 113_A24

第二型糖尿病病患於急性腎臟病後之 Metformin 使用預後

Outcomes of metformin use in type 2 diabetes mellitus patients following acute kidney disease

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Background
Metformin is a cornerstone in the management of type 2 diabetes mellitus(T2DM). However, its use has been associated with lactic acidosis and is contraindicated in patients with impaired renal function, such as those with acute kidney disease (AKD). The outcomes of metformin use in patients with AKD remain unclear. This study aims to evaluate the outcomes of metformin therapy in T2DM patients with AKD.

Methods
We conducted a retrospective cohort study utilizing data from the Applied Health Research Data Integration Service provided by the National Health Insurance Administration. The study population comprised T2DM patients between January 1, 2015, and September 1, 2020, with follow-up data extending through December 31, 2020. Eligible patients were those who had experienced an AKD episode during hospitalization, required dialysis at least once, but did not require ongoing dialysis 90 days post-discharge. Propensity score matching (PSM) was utilized to assess the effects of metformin use on outcomes including mortality, re-dialysis, major adverse kidney events (MAKE), major adverse cardiovascular events (MACE), and the incidence of metabolic acidosis.

Results
There is total 11576 patients were enrolled in the study, including 3487 patients who received metformin and 8089 patients who did not use metformin following the episode of AKD. After 1:1 PSM, 5,334 patients (average age of 69.5 and male of 44.7%), were divided into two groups, with no significant differences observed across 19 baseline variables. Metformin use was associated with lower mortality (hazard ratio (HR) 0.89; 95% CI 0.82-0.97; p=0.01), lower re-dialysis (HR 0.69, 95% CI 0.61-0.77; p<0.001), lower MAKE (HR 0.78, 95% CI 0.72-0.84; p=0.001). However, metformin was also linked to an increased risk of metabolic acidosis (HR 1.27; 95% CI 1.0-1.6; p=0.045).

Conclusion
In T2DM patients following AKD, metformin use was associated with improved survival, lower rates of MAKE, and a reduced need for re-dialysis. However, there is a heightened risk of metabolic acidosis, underscoring the necessity of vigilant monitoring for lactic acidosis. While resuming metformin post-AKD appears beneficial, it requires careful clinical oversight to balance its benefits and risks.

原著論文 113_A25

運用基因體與轉錄體針對帶有 DNMT3A 突變之急性骨髓性白血病的預後分析

Genomic and transcriptomic determinants on clinical outcome in AML patients with DNMT3A mutation

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Background
The prognostic impact of co-mutations and transcriptomics in acute myeloid leukemia (AML) with DNMT3A mutations remains to be explored. This study aimed to investigate the genomic and transcriptomic determinants of clinical outcomes in AML patients with DNMT3A mutations.

Methods
A cohort of 887 AML patients homogeneously treated with intensive chemotherapy was examined. Next generation sequencing (NGS) and RNA sequencing on bone marrow samples at initial diagnosis were done. NGS was done using the TruSight myeloid sequencing panel (Illumina, San Diego, CA, USA), which included 54 oncogenic hotspot genes. For RNA sequencing, the sequencing libraries were prepared by using the TruSeq Stranded mRNA Library Prep Kit (Illumina, San Diego, CA, USA). The qualified libraries were then sequenced on Illumina NovaSeq 6000.

Results
In our cohort, 148 patients (16.7%) had DNMT3A mutations. The most frequent co-mutations were NPM1 (52.7%), FLT3-ITD (31.1%), and IDH2 (26.4%). In the NPM1-mutated subgroup, the presence of FLT3-ITD significantly predicted worse overall survival (OS) compared to those without this mutation (5-year OS 22% vs. 37%, P=0.03). Additionally, patients with FLT3-TKD or NRAS had better OS compared to those without these mutations (5-year OS 47% vs. 24%, P=0.041). Next, we conducted a comparison of RNA-seq data between patients with short event-free Survival (EFS) (n=48, EFS <2 years) and long EFS (n=20). A total of 301 differentially expressed genes were identified, with $|log2FC| > 0.5$ and P value <0.05. By using HALLMARK genesets, TNF alpha (NES 2.89, FDR 0) and interferon signaling (Normalized enrichement score (NES) 2.77, FDR 0) were among the top enriched genesets in patients with short EFS. This finding was validated in Gene Ontology Biological Process and Reactome gene sets.

Conclusion
In summary, our results suggest that concurrent mutations and dysregulated immune pathways contribute to the heterogeneous clinical outcomes in patients with DNMT3A mutations.

原著論文 113_A26

原發性膽道炎患者罹患大腸瘜肉及大腸直腸癌之風險：一台灣人口為基礎的回溯性世代研究

Risk of Colon Polyps and Colorectal Cancer in Primary Biliary Cholangitis, A Population-Based Retrospective Cohort Study in Taiwan

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Background

Primary biliary cholangitis (PBC) is characterized by immunological markers of cholestasis, such as serum antimitochondrial autoantibodies (AMA). Bile acids are carcinogens causing mutations leading to colorectal cancer (CRC). Higher total bile acid concentrations in patients with PBC compared with healthy controls have been reported in previous studies. However, the association between PBC and the risk for CRC remains controversial. This retrospective cohort study aimed to investigate the association between PBC and the development of colonic polyps leading to CRC overall. We assumed that patients with PBC would have higher risk of CRC and colon polyps compared to the general population due to the cholestatic condition.

Methods

The study enrolled 1,936,512 individuals from the Longitudinal Health Insurance Database spanning 2000 to 2017 for cohort analysis. Individuals assigned to ICD-9-CM code and ICD-10-CM codes representing PBC were incorporated. The inclusion criteria were adjusted to include Alk-p and AMA measurements, as well as UDCA treatment. A 1:4 control cohort was randomly selected as a comparison cohort. All study participants were followed up from the index date of January 1, 2000, until the occurrence of colon polyps, benign neoplasms, CRC, withdrawal from the NHI program, or December 31, 2017. CRC, colon polyps and benign neoplasms were identified according to ICD-9-CM codes and ICD-10-CM codes. After correcting the demographic variation by using Cox regression analysis, we calculated hazard ratios to evaluate the risk of developing colon polyps and CRC in PBC patients compared to general populations.

Results

Within the study cohort, consisting of 2024 individuals meeting the inclusion criteria, 199 patients developed colon polyps or CRC. In contrast, among the 8096 individuals in the comparison cohort, 650 cases of colon polyps or CRC were observed during the 17-year-follow-up period. According to Cox regression analysis, the adjusted hazard ratio indicated that the risk was 1.678 times higher in the PBC group compared to the comparison group.

Conclusion

This cohort study presents that patients with PBC have a higher risk (1.678-fold) of developing colon polyps and CRC. The finding above supported rationale of endoscopic examination in PBC patients.

原著論文 113_A27

冠狀動脈疾病患者鐵質缺乏與新發生左心室功能不良之單一中心研究分析

Iron deficiency and the Risk of Incident Left Ventricular Dysfunction in Patients with Coronary Artery Disease: A Single-center Cohort Study

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Background
Heart failure is a complex and life-threatening condition that often coexists with comorbidities such as hypertension, type 2 diabetes mellitus, coronary artery disease (CAD), and iron deficiency. However, the relationship between iron deficiency and the development of HF remains poorly understood.

Methods
A total of 64,661 patients diagnosed with CAD at a tertiary hospital between 2011 and 2023 were recruited. Of these, 4,813 patients who underwent iron status evaluation, including serum iron (SI), total iron binding capacity (TIBC), and ferritin, were included in the analysis. We compared the incidence and hazard ratio (HR) of new-onset left ventricular (LV) dysfunction (LV ejection fraction < 50%) between patients with and without iron deficiency, defined as SI/TIBC or transferrin saturation (TSAT) < 20% or ferritin < 100 ng/mL.

Results
The incidence of new-onset LV dysfunction was higher in patients with TSAT < 20% compared to those with normal TSAT (HR, 1.40; 95% confidence interval [CI], 1.14–1.72) over a 13-year follow-up. In multivariable analysis, TSAT < 20% retained its predictive value for new-onset LV dysfunction (adjusted HR, 1.24; 95% CI, 1.01–1.54), while ferritin levels were not correlated with the incidence of new-onset LV dysfunction in this cohort. The all-cause mortality rate was also higher in patients with TSAT < 20% compared to those with normal TSAT. A subgroup analysis revealed no significant difference in predicting new-onset LV dysfunction between patients with iron deficiency, with or without coexisting anemia (p = 0.165).

Conclusion
In patients with CAD, iron deficiency, particularly defined by TSAT < 20%, was predictive of future LV dysfunction and associated outcomes. Further studies are needed to investigate the underlying mechanisms and causal relationship between iron deficiency and the risk of LV dysfunction.

原著論文 113_A28

混成式酒精注射及射頻消融術於甲狀腺多間隔巨大腫瘤階段性治療

The Sequential Hybrid Staging Management of Huge Complicated Multi-Septa Tumor in Thyroid by Radiofrequency Ablation Following Percutaneous Ethanol Injection

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Background

To consider of safety, efficacy, and cosmetic appearance with minimal invasion, complicated multi-septa tumor is difficult to resolve in thyroid. Therefore, we would like to demonstrate an innovative procedure to approach this kind of complicated multi-septa tumor by staging managements.

Methods

According to the characteristics of complicated multi-septa tumors, these kinds of tumors contained two major parts; one is cystic part with multiple septa as fluid cells, containing watery or glue-like fluid inside which is difficult to be resolved by radiofrequency ablation, and another part is nodular manifestations in tumor. Initially, the complicated multiple-septa thyroid tumors consist with cystic part with septa, which is around one-third volume of total tumor and the other part is nodular lesion, confirmed as benign lesions in these cases. We aspirate the intra-tumor fluid and perform ethanol injections in each fluid cells separated by septum two times by three-month interval. After each time of ethanol injection, we perform thyroid ultrasound examination to evaluate the volume of cystic part and tumor characteristics every month. We aspirate intra-tumor fluid and injected 95% ethanol half amount of aspirated fluid volume in 5 minutes retention time at the first time of ethanol injection. After 3 months, the mean residual volumes of multiple-septa cysts are 32.2% of initial volumes; we perform second-time ethanol injection with half residual cystic volume of 95% ethanol in 5 minutes retention time. We perform radiofrequency ablation in these 6 cases with complicated multiple-septa thyroid tumors after completed ethanol injections one month and evaluate the tumor volumes and characteristics for 12 months.

Results

Initially, the mean of overall volume of thyroid tumors in the 6 cases is 17.3 ± 1.7 mL, consisted with cystic part with septa is 6.2 ± 1.3 mL. We aspirated intra-tumor fluids and ethanol injection two times and then performed radiofrequency ablation in each case. After 6-month and one-year follow-up, the means of volume reduction rate in these complicated multi-septa tumors are 88.3 ± 3.7 % and 95.3 ± 2.6 % compared with initially volume.

Conclusion

The sequential hybrid staging management of complicated multi-septa thyroid tumor is high efficacy and safety by radiofrequency ablation following percutaneous ethanol injections. This technique in initial stage via ethanol injections could resolve cystic part of thyroid tumor as the limitation of radiofrequency ablation. In the second stage, radiofrequency ablation can resolve the

nodular part of thyroid tumor and preserve thyroid function with minimal damages. Minimal invasion, cosmetic appearances and rapid tumor shrinkage are the advantages of innovative hybrid staging managements in complicated multi-septa thyroid tumor.

原著論文 113_A29

金屬硫蛋白之專一性抗體於非酒精性脂肪肝疾病所扮演潛在之角色

The Potential Roles of Anti-Metallothionein Antibody in Non-Alcoholic Fatty Liver Disease

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Background

There is increasing evidence to indicate inflammation links between obesity, diabetes and non-alcoholic fatty liver disease (NAFLD). Metallothionein (MT), first discovered in 1957, is a small but heat stable molecule, which will be highly expressed under stressful condition. Recently, MT is demonstrated to exert immunomodulatory effects like increasing chemotaxis and to enhancing lymphocyte proliferation and differentiation, thereby causing some disorders like inflammatory bowel diseases (IBD). Therefore, we suppose that anti-MT antibody may block MT related chemotaxis to ameliorate meta-inflammation in the pathogenesis of obesity related NAFLD like it does in IBD.

Methods

Male B6 mice were used for our treatment study for obesity related complications and initially those mice were randomized into 3 groups and then they were asked to have HFD at the age of 5 weeks. After HFD feeding for 13 weeks, the mice were arranged to undergo the first intra-peritoneal glucose tolerance test (ipGTT) for baseline assessment. One week later after the first ipGTT, those 3 groups of mice received different treatment with PBS (for negative control), MOPC (non-specific IgG; for isotype control) and UC1MT (anti-MT specific antibody), respectively. The drugs were given intraperitoneally, twice a week and the dosage of each drug was the same, that is 100ul per each mouse. The concentration of both UC1MT and MOPC was 1mg/ml. Total therapeutic course was 8 weeks and all mice of each group were persistently fed on high fat diet. Finally, they were sacrificed at the age of 27 weeks.

Results

In liver, we examined genes involved in proinflammatory cytokines, genes of anti-inflammatory cytokines, genes involved in hepatic gluconeogenesis, genes involved in hepatic de novo lipogenesis, PPAR family like PPAR-delta genes, and genes involved in beta oxidation. The qPCR results of liver indicated obvious downregulation of MCP1 gene was observed in UC1MT. The results suggested anti-MT acts as an anti-chemotactic agent. To sum up, UC1MT mice are supposed to have less hepatic steatosis by lower expression of MCP1, ChREBP, FAS, SCD1 and elovl6. The healthiest gross appearance of liver was also observed in UC1MT group during dissection.

Conclusion

Our study may provide an additional mechanism underlying the anti-obesity related hepatic complication effect of anti-MT specific antibody. The results also illustrate a rationale for the pleiotropic effects of anti-MT specific antibody in patients with obesity related nonalcoholic fatty

liver disease, and extracellular MT signaling may be a potential therapeutic target in obesity related hepatic complication.

原著論文 113_A30

達到 50%目標劑量或持續使用血管張力素受體-腦啡肽酶抑制劑的預測因素：針對台灣年長心衰竭患者的研究

Predictors for Reaching 50% Target Dose or Continuation for Angiotensin Receptor Neprilysin Inhibitors in elder Taiwanese Patient With Heart Failure

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Background
The Treatment with Angiotensin Receptor neprilysin inhibitor fOr Taiwan Heart Failure patients (TAROT-HF) study evaluates the effectiveness of angiotensin receptor neprilysin inhibitors (ARNi) in Taiwanese population. This study aims to identify predictors for continuing ARNi or reaching 50% of the target dose the elder patients.

Methods
392 patients with reduced ejection fraction heart failure, aged above 75 who received ARNi were included from the registry. A logistic regression analysis with both univariate and multivariate models was used to examine a range of baseline clinical factors and comorbidities. Odds ratios (OR) and p-values were calculated to determine the significance of each variable.

Results
In the univariate analysis, higher baseline systolic blood pressure (OR = 1.018, $p < 0.001$) and diastolic blood pressure (OR = 1.023, $p < 0.01$) were significant positive predictors of reaching 50% of the ARNi target dose. The use of beta-blockers (OR = 2.214, $p < 0.01$) and renin-angiotensin-aldosterone system (RAAS) inhibitors (OR = 2.077, $p < 0.01$) were also associated with a higher likelihood of dose escalation. Diabetes mellitus (OR = 1.708, $p < 0.01$) was another positive predictor, while atrial fibrillation (OR = 0.49, $p < 0.001$) was a significant negative predictor. In the multivariate analysis, systolic blood pressure (OR = 1.019, $p < 0.05$), beta-blocker use (OR = 2.45, $p < 0.01$), RAASi inhibitor use (OR = 2.01, $p < 0.05$), and diabetes mellitus (OR = 1.702, $p < 0.05$) remained significant predictors, while atrial fibrillation continued to show a negative association (OR = 0.486, $p < 0.01$). Regarding predictors for continuation in any dose, lower baseline ejection fraction of left ventricle was associated with significant negative, while RAAS inhibitors user remain as a positive predictor in both univariate and multivariate analysis.

Conclusion
Reaching 50% of the ARNi target dose in patients aged over 75 is significantly influenced by baseline systolic blood pressure, beta-blocker use, and the presence of diabetes mellitus. Atrial fibrillation, however, serves as a major barrier to dose escalation. These findings underscore the importance of managing blood pressure, optimizing beta-blocker therapy, and controlling diabetes in facilitating ARNi dose escalation in elderly heart failure patients, while recognizing the challenges posed by atrial fibrillation in this age group.

原著論文 113_A31

中藥對甲狀腺功能亢進症和骨質疏鬆症患者骨折、住院和死亡風險的影響 - 一項全國性、基於人群的隊列研究

The Effect of Traditional Chinese Medicine on the Risk of Fracture, Hospitalization and Mortality in Patients with Hyperthyroidism and Osteoporosis - a Nationwide, Population-Based Cohort Study

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Background
Previous studies have confirmed that hyperthyroidism is a common cause of secondary osteoporosis and can worsen the severity of osteoporosis in patients. This study is mainly based on the Taiwan National Health Insurance Database (TNHID). Through big data analysis, it shows that combining traditional Chinese medicine (TCM) treatment can help the health of patients with hyperthyroidism and osteoporosis.

Methods
From TNHID, 4,980 patients who received TCM treatment and 19,920 controls who did not receive TCM treatment were selected at a ratio of 4:1 according to gender, age, and year. Cox proportional hazards analyzes were performed to compare fracture, inpatient, and all-cause mortality over an average follow-up period of 15 years.

Results
A total of 4745/5823/3487 subjects (19.06%/23.39%/14.00%) suffered fractures/hospitalization/all-cause death, including 901/752/511 (15.10%/19.82%/10.26%) in the TCM group ; The control group was 3993/4836/2976 (20.05%/24.28%/14.94%). Cox proportional hazards regression analysis showed that subjects in the TCM group had lower fractures, hospital mortality and all-cause mortality (adjusted HR=0.549; 95% CI=0.386-0.656, P<0.001; adjusted HR=0.599; 95 % CI= 0.467-0.689, P < 0.001; adjusted HR=0.674; 95% CI=0.561-0.764, P < 0.001. Kaplan-Meier analysis showed that the TCM group had lower cumulative risks of fractures, hospitalization and death (all significant).

Conclusion
The analysis of this study shows that combined TCM treatment in patients with hyperthyroidism and osteoporosis is associated with a lower risk of fracture, hospitalization, or all-cause death, providing clinicians with treatment options.

原著論文 113_A32

Statin 類藥物對金黃色葡萄球菌菌血症結果的正面效益：基於 MIMIC-IV 數據庫的回顧性分析

Beneficial Effects of Statin Therapy on the Outcomes of *Staphylococcus aureus* Bacteremia ：A Retrospective Analysis Based on MIMIC-IV Database

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Background

Staphylococcus aureus bacteremia (SAB) is a serious infection with high mortality rates, despite effective treatments. Statins, primarily used for lowering cholesterol, have been found to have potential pleiotropic effects, including reducing risk of sepsis. However, research on the benefits of statins on those with SAB remains inconclusive. While some studies suggest that statins could lower mortality of those with SAB, others show no clear effect. Our study aims to determine the impact of statins on the outcomes of those with SAB.

Methods

Data on a total of 898 SAB patients were obtained from the MIMIC-IV (Medical Information Mart for Intensive Care IV) database, including those with positive blood cultures for S. aureus either during hospitalization or within three days prior to admission. In our analysis, we classified the data into two groups based on survival status and conducted a multivariate analysis to elucidate the independent risk factors. We executed a survival analysis and presented the results using a Kaplan-Meier curve. Then we further performed a survival analysis on different types of statins.

Results

We found that statin use significantly improved the 28-day survival rate in patients with SAB. Further analysis stratified by statin use revealed that patients who use statins have more comorbidities, such as obesity, hypertension, diabetes mellitus, compared to those who do not use statins. Despite more comorbidities, those who use statin had lower 28-day mortality rate. Notably, this outcome was not influenced by the use of different antibiotics or bacterial resistance.

Conclusion

Our research aims to identify crucial factors, particularly the therapeutic role of statins, in reducing mortality rates. This could furnish further support for clinical strategies to decrease mortality rates and severity among patients with SAB.

原著論文 113_A33

生物製劑治療重度過敏性氣喘患者中第 2 型發炎指標的變化與臨床結果

Longitudinal Changes in Type 2 Inflammatory Markers and Clinical Outcomes in Severe Allergic Asthma Treated with biological agents

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Background

Severe allergic asthma involves elevated type 2 (T2) inflammatory markers like eosinophils and IgE. This study evaluates how these markers change over time with omalizumab and mepolizumab treatment and their correlation with clinical outcomes.

Methods

Ninety-seven patients with severe allergic asthma treated with either omalizumab (n=50) or mepolizumab (n=40) were prospectively followed. Clinical outcomes, including Asthma Control Test (ACT) scores, Forced Expiratory Volume (FEV1), acute exacerbations (AE), and steroid use, were assessed at baseline, 6, and 12 months. Changes in eosinophil counts and IgE levels were also analyzed for correlations with clinical outcomes.

Results

Both treatments led to significant improvements in clinical outcomes. ACT scores increased at 6 and 12 months ($p<0.01$), indicating better asthma control. FEV1 improved modestly ($p<0.05$), while AEs and steroid doses decreased significantly ($p<0.01$). Eosinophil counts reduced with both treatments ($p<0.05$), with significant correlations between baseline eosinophils and IgE ($r=0.31$, $p=0.0403$ for omalizumab; $r=0.44$, $p=0.0182$ for mepolizumab). In the omalizumab group, higher baseline eosinophil levels were associated with greater FEV1 improvement at 6 months ($r=0.65$, $p<0.01$) and moderately at 12 months ($r=0.53$, $p<0.05$). For mepolizumab, reductions in IgE at 6 and 12 months strongly correlated with FEV1 improvements ($r=-0.65$ to -0.77, $p<0.05$).

Conclusion

Omalizumab and mepolizumab significantly improve clinical outcomes in severe allergic asthma. Correlations between eosinophil and IgE changes and clinical improvements suggest these markers could predict therapeutic response. Further studies are needed to refine personalized treatment based on T2 marker profiles.

原著論文 113_A34

國立台大醫院與台北市立聯合醫院忠孝院區雙向轉診問卷填寫者的特徵與問卷構面和問卷項目的關係

Relationships between the Characters of Questionnaire Responders with the Individual Testlets and Items of the Questionnaires of patients of Bidirectional Referrals between National Taiwan University Hospital and Taipei City Hospital, Zhongxiao Campus

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Background
The usage of questionnaires to assess the satisfaction of patients is the modern advances in the revolution of health care systems. We aimed to correlate the characteristics of bidirectional patients who respond effectively to bidirectional referral interventions with the individual testlets of the questionnaires

Methods
Based on the patient's age group, weeks of hospitalization, gender, education level, identity of the questionnaire respondents, we analyzed the relationships between these characters of patients and average score for each testlet and the response score of each item and total scores of this hospital and bidirectional referral.

Results
Educational attainments of patient were found to influence and low level significantly and positively correlate with item 1 of Environment and item 29 of Process. Patients' age groups were noted to affect and low level significantly and positively associated with item 12 of Administrative Efficiency, item 29 and 27 of Process, item 24 of Attitude, item 41 and 42 of overall evaluation.

Conclusion
While interpreting the bidirectional questionnaires data, we should take into account the influence of age and levels of education.

原著論文 113_A35

Daptomycin 在治療腹膜透析相關腹膜炎之臨床療效-臨床初探研究

Clinical Efficacy of Daptomycin In Treating Peritoneal Dialysis-associated Peritonitis – Preliminary Clinical Insights

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Background

Peritonitis is a serious complication in patients on peritoneal dialysis (PD). More evidence demonstrated increasing failure rate of Vancomycin treatment against methicillin-resistant Gram-positive pathogens. This study aimed to analyze the preliminary clinical effects of Daptomycin on peritoneal dialysis-associated peritonitis (PDAP).

Methods

A retrospective study was conducted in a northern medical center from January 1, 2015. All enrolled patients initially diagnosed with PDAP and received standard treatment in accordance with the ISPD peritonitis guideline. Intraperitoneal (IP) and/or intravenous (IV) daptomycin were administered for those with initial treatment failure or those infected with methicillin-resistant Gram-positive organisms with Vancomycin MICs ≧1μg/mL or Vancomycin-resistant Enterococci. We collected and analyzed the patient's characters, clinical data and biochemistries to observe the treatment effect and clinical outcomes.

Results

In this study, 12 PD patients (7 male and 5 female) with mean age of 58.5years were enrolled. Among these patients, more than half had hypertension or undergoing APD and five had diabetes. Initial microbiology reported 8 gram-positive pathogens, 2 gram-negative bacilli (GNB) and 2 culture-negative. Daptomycin was introduced into the treatment regimen at a mean dose of 9 mg/kg. The overall treatment response rate achieved 75%, with no recurrence within 3 months after treatment completion. Notably, PD catheter salvage was successful in one GNB case and one culture-negative case. The all-cause mortality rate was less than 30% after one-year follow-up.

Conclusion

These results demonstrated that Daptomycin can reach high response rate and successfully salvage PD tube removal for patients infected with methicillin-resistant Gram-positive pathogens. Both recurrent and mortality rate were quite low after administering Daptomycin. It seems Daptomycin might replace Vancomycin as first-line empirical therapy for high risk of methicillin-resistant Gram-positive PDAP in the future.

原著論文 113_A36

一尖端人工智慧即時透析期間低血壓預測系統之臨床預後分析

Clinical Outcomes of A Cutting-Edge Artificial Intelligence-Driven System for Real-time Intradialytic Hypotension Prediction

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Background
Intradialytic hypotension (IDH) is a common and serious complication of chronic dialysis treatment, with long-term consequences such as increased cardiovascular and all-cause mortality. The BestShape, an artificial intelligence-driven system for real-time intradialytic hypotension prediction, was previously developed. This study aimed to demonstrated the preliminary clinical results and health economic benefits following the incorporation of the BestShape in medical institutions across Taiwan.

Methods
This is a retrospective study. From January 1, 2020, two medical institutions in Taiwan (Mackay Memorial Hospital Taipei and Tamshui branches) incorporated BestShape into all hemodialysis (HD) sessions. The Vital Info Portal (VIP) gateway, connected to the HD device, collected the parameters in each HD session. The data from consecutive HD sessions spanning from January 2020 to September 2023, following the implementation of BestShape, constituted the observational group. The data retrieved from January 2019 through the end of 2019 served as the historical control group. The primary outcome was the frequency of IDH, and the secondary outcomes were the rates of cardiopulmonary resuscitation (CPR), fall, and providers' satisfaction, mortality rates, and estimated total cost reduction.

Results
A total of 104,117 HD sessions during the study period were included (observational group: 66,683; control group: 37,434 sessions) for analyses. The monthly average IDH rates decreased significantly from 27.4% to 20.3% ($p<0.05$) after incorporation of BestShape. The occurrences of CPR during dialysis decreased from 5 to 3 times, resulting in an estimated total cost reduction of 47 thousand USD annually. In addition, post-dialysis falls decreased from 5 to 1 times. The mortality rates during the HD sessions prior to (2017-2019) BestShape implementation were 8.3%, and 10.6% afterwards (2020-2022), with no statistically significant differences. The medical staff expressed significant satisfaction with BestShape, as evidenced by average satisfaction scores of 86.5 and 85.5 in Tamshi and Taipei branch, respectively.

Conclusion
This study presents the initial outcomes of incorporating BestShape within Taiwanese hospitals,

revealing a high level of satisfaction among medical staff and achieving notable reductions in IDH, CPR incidents, and falls. These improvements hold the potential for substantial reductions in healthcare costs.

原著論文 113_A37

在一項大型台灣族群縱貫性研究探討顯示素食可減少胃食道逆流症

Vegetarian Diet Reduced Gastroesophageal Reflux Disease in a Nationwide Longitudinal Survey in Taiwan

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Background
Many studies have indicated that vegetarians may have reduced risks of cardiovascular diseases, hypertension and diabetes. However, information regarding the correlation between vegetarianism, the duration of a vegetarian diet, types of vegetarian diets, and gastroesophageal reflux disease (GERD) is limited. This study aims to explore the impact of vegetarianism and related factors on incident GERD in a large Taiwanese population follow-up study.

Methods
Our study cohort was sourced from the Taiwan Biobank. Vegetarian status, duration of vegetarianism, types of vegetarian diets, and GERD presence were assessed using self-reported questionnaires. Participants were categorized into three groups based on their vegetarian status: never, current, and ever vegetarians. Additionally, participants were divided into three groups based on the duration of their vegetarian diet: never, < 6 years and ≧6 years. Vegetarians were asked to specify whether they followed a vegan, lacto-vegetarian, ovo-vegetarian, or lacto-ovo-vegetarian diet. The association between vegetarian diet and incident GERD was analyzed using multiple logistic regression after controlling for confounders. Cox regression models were used to estimate the associations.

Results
We collected data from 23,714 participants (excluding those with pre-existing GERD). Multivariable analysis showed that vegetarian diet status (current vs. never; hazard ratio [HR], 0.697; 95% confidence interval [CI], 0.546 to 0.889; $p = 0.004$) was significantly associated with incident GERD, however, ever vegetarian diet was not ($p = 0.489$). Additionally, those who had been vegetarians for more than six years had a 0.72 times risk of GERD compared to never vegetarians (HR, 0.717; 95% CI 0.558 to 0.922, $p = 0.009$). No significant differences were observed regarding the types of vegetarian diets with incident GERD.

Conclusion
We found that being a vegetarian is an independent protective factor (0.697 times) for incident GERD, with a significant protective effect observed in those who maintained a vegetarian diet for more than six years (0.717 times). Future research should investigate the underlying mechanisms and explore whether vegetarianism can be widely adopted to reduce GERD incidence.

原著論文 113_A38

依抗生素敏感性引導之含鉍劑 14 天四合療法在第二線胃幽門桿菌除菌治療獲得良好清除率

14-day bismuth-based, susceptibility-guided treatment achieves high eradication rates for Helicobacter pylori infection as a second-line therapy.

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Background
Helicobacter pylori is known to cause gastritis and peptic ulcers and is a significant factor in the development of gastric cancer. Eliminating H. pylori has been shown to decrease the risk of subsequent cancer development. The first-line treatment recommended by current guidelines is PPI-based triple therapy or bismuth-containing quadruple therapy. However, due to the increasing prevalence of clarithromycin-resistant strains and more frequent treatment failures, susceptibility-guided therapy (SGT) is considered a promising approach to improve eradication rates of Helicobacter pylori. Current guidelines suggest using H. pylori culture with susceptibility testing as a third-line option for eradication, but there is limited evidence supporting its effectiveness as a second-line therapy.
This study aimed to evaluate the efficacy of culture-guided therapy as a second-line treatment for Helicobacter pylori infection.

Methods
From October 2019 to August 2023, we retrospectively included patients with H. pylori infection who had failed initial eradication attempts. These patients received a 14-day second-line anti-H. pylori therapy consisting of bismuth-containing quadruple therapy (esomeprazole, bismuth, and two antibiotics selected based on antimicrobial sensitivity tests). Five different regimens were analyzed. The primary endpoint was eradication rates, while secondary endpoints included adverse effects and patient compliance.

Results
Among the 38 patients, the overall intention-to-treat eradication rate for bismuth-containing SGT as a second-line therapy was 94.7%. Subgroup analysis showed a 100% cure rate for the EBTL, EBTM, and EBAL 14-day regimens, while lower eradication rates were observed for EBCA and EBAT 14-day therapies, with rates of 50% and 75%, respectively. Adverse events were observed in 50% of patients, with nausea (34.2%), vomiting, and abdominal pain being the most common. Compliance was 89.5%, with therapy discontinued primarily due to adverse effects.

Conclusion
The 14-day bismuth-containing susceptibility-guided regimens used as a second-line rescue therapy demonstrated a high eradication rate. However, careful monitoring of side effects and patient compliance is necessary to achieve better eradication outcomes.

原著論文 113_A39

腎移植受贈者術前抗 B 型肝炎表面抗體效價對免疫喪失及肝炎復發的影響

Impact of Pre-Transplant Anti-HBs Levels on Immunity Loss and Hepatitis B reactivation in Kidney Transplant Recipients

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Background

Anti-hepatitis B surface antibody (anti-HBs) levels 10 mIU/mL are generally considered to have protective immunity against hepatitis B virus (HBV) infections or reactivation. However, the optimal protective titer remains unclear in kidney transplant recipients (KTRs), and loss of immunity is common due to the use of immunosuppressive therapy. This study aims to assess the longitudinal trajectory of antibody response over time and investigate its association with HBV reactivation in KTRs.

Methods

Between 2013 to 2023, 101 KTRs at Kaohsiung Veterans General Hospital were enrolled. Seventy-seven recipients with pre-transplant anti-HBs levels ≧10 mIU/mL and negative hepatitis B surface antigen (HBsAg) were included. Clinical parameters were compared between patients who maintained HBV immunity and those who experienced post-transplant immunity loss.

Results

Post-transplant, 15 patients (19%) experienced seroconversion to negative anti-HBs (<10 mIU/mL) status, all of whom had pre-transplant anti-HBs titers <80 mIU/mL. Notably, 12 of these patients (80%) lost immunity within the first year post-transplant. Four patients, who were also anti-hepatitis B core antibody (anti-HBc) positive, developed HBV-related hepatitis. Among these, one received a graft from an HBsAg-positive donor, two from HBsAg-negative, anti-HBc-positive donors, and one from an HBsAg-negative, anti-HBc-negative donor. Multivariate analysis identified the pre-transplant anti-HBs titer as the only significant protective factor against immunity loss, with a hazard ratio of 0.96 (95% CI: 0.93–0.99, p=0.008).

Conclusion

KTRs with prior resolved HBV infection and pre-transplant anti-HBs titers <80 mIU/mL are at an increased risk for HBV reactivation, regardless of donor HBV status. Prophylactic antiviral therapy should be strongly considered in these high-risk patients to prevent HBV reactivation.

原著論文 113_A40

對於消化性潰瘍出血，比較在腎上腺素注射術後併用氬氣電漿凝固術或併用止血夾兩者的止血療效之隨機控制試驗

A randomized controlled trial comparing argon plasma coagulation combined with diluted epinephrine injection to hemoclipping with diluted epinephrine injection for the management of high-risk peptic ulcer bleeding: an interim report

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Background
Endoscopic treatment is the recommended approach for achieving initial hemostasis in non-variceal upper gastrointestinal bleeding. Various endoscopic devices have demonstrated efficacy in managing bleeding ulcers; however, the additional hemostatic benefits of argon plasma coagulation following endoscopic injection therapy remained under-explored. This study aims to compare the efficacy of APC combined with diluted epinephrine injection (APC) to hemoclipping with diluted epinephrine injection (Clip) in treating high-risk peptic ulcer bleeding.

Methods
From 2019/01 to 2023/11, consecutive patients presenting with high-risk bleeding ulcers—characterized by active bleeding, non-bleeding visible vessels, or adherent clots—were enrolled. Patients were prospectively assigned to receive either APC therapy plus diluted epinephrine injection or hemoclipping plus diluted epinephrine injection. After endoscopy, patients received Pantoprazole infusion during fasting and continued oral administration for 8 weeks to promote ulcer healing. Instances of rebleeding were managed with endoscopic combination therapy. Those who did not respond to retreatment aforementioned underwent emergency surgery or arterial embolization. Data were analyzed using mean ± SD, with comparisons made via Student's t-test for quantitative variables and Chi-square or Fisher's exact test for qualitative variables. All hypothesis tests were performed against a two-sided alternative, where appropriate.

Results
A total of 163 eligible patients were analyzed. The hemostatic efficacy of 78 patients treated with APC plus diluted epinephrine was compared with 85 patients treated with hemoclipping plus diluted epinephrine. Both groups were similar in baseline characteristics. Initial hemostasis was achieved in 77 patients in the APC group and 85 patients in the Clip group (98.7% vs. 98.8%, *p* value = 1.000). Rebleeding occurred in 6 patients from the APC group and 8 from the Clip group (7.7% vs. 9.4%, *p* value = 0.784). No significant differences were found between the two groups regarding the need for surgery (1.3% vs. 1.2%, *p* value = 1.000), transarterial embolization (1.3% vs. 2.4%, *p* value = 1.000), or mortality (1.3% vs. 1.2%, *p* value = 1.000). No significant differences were observed in hospital stay or transfusion requirements.

Conclusion
Endoscopic therapy using APC combined with diluted epinephrine injection is as effective as

hemoclipping combined with diluted epinephrine injection for preventing rebleeding in high-risk bleeding ulcers. Both methods demonstrated similar safety profiles during therapeutic endoscopy.

原著論文 113_A41

皮質類固醇在重症社區型性肺炎的療效分析系統性整合與網絡統合分析

Unraveling Corticosteroid Efficacy in the Treatment of Severe Community-Acquired Pneumonia: A Systematic Review and Network Meta-Analysis

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Background
Numerous studies have demonstrated the benefits of adjunctive corticosteroids in the treatment of severe community-acquired pneumonia (sCAP). However, the persistence of their anti-inflammatory effects over time remains unclear. Therefore, we conducted this systematic review and network meta-analysis to evaluate the comparative clinical efficacy and safety of corticosteroids in patients with sCAP.

Methods
We assessed the efficacy of corticosteroids and 30-day all-cause mortality using data from randomized controlled trials identified through Embase, the Cochrane Library, and PubMed. A Bayesian network meta-analysis (NMA) and a modeling-based time-series NMA (MBNMA) were conducted, incorporating differences in response over time, to extrapolate the long-term clinical efficacy and safety of corticosteroids in patients with sCAP.

Results
The evidence network comprised 12 randomized controlled trials (RCTs) involving 3,272 patients with sCAP, yielded pooled results indicating a significant reduction in the risk of mortality with steroids compared to control in sequential analysis (RR: 0.61; 95% CI 0.43–0.87). A Bayesian network meta-analysis assessed the impact of corticosteroids, including Dexamethasone, Hydrocortisone, Hydrocortisone + Fludrocortisone, and Methylprednisolone, on mortality and related complications. Hydrocortisone, both alone and in combination with fludrocortisone, demonstrated a statistically significant reduction in mortality, with a Risk Ratio (RR) of 0.478 (95% CI, 0.318 to 0.717). However, mortality rates plotted over time revealed variability in response, similar to findings with other corticosteroids, suggesting that the effects of corticosteroids differ, with some providing only minor benefits or no significant effect.

Conclusion
The response to treatment varies among different corticosteroids, with hydrocortisone or its combinations appearing to offer a quicker and more sustained effect. However, the limited data on other corticosteroids like dexamethasone and prednisone make it difficult to assess their long-term benefits. The observed variability in the placebo group also suggests that factors beyond corticosteroid treatment may influence outcomes. While hydrocortisone seems more promising, further research is needed to definitively establish its therapeutic effectiveness.

原著論文 113_A42

昇糖素類似胜肽在患有慢性腎病的第二型糖尿病患者之療效：回顧性研究

Unraveling Efficacy of Semaglutide in Type 2 Diabetes Mellitus with Chronic Kidney Disease: A Retrospective Cohort Study

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Background
Type 2 Diabetes Mellitus (T2DM) is a leading cause of Chronic Kidney Disease (CKD), and managing both conditions simultaneously presents a significant clinical challenge nowadays. GLP-1 receptor agonists, such as semaglutide, have demonstrated promising effects in managing hyperglycemia, weight loss, and cardiovascular outcomes. However, limited data have shown their efficacy on renal outcomes of patients with T2DM. This study aims to evaluate the efficacy of semaglutide on preserving renal function in patients with T2DM.

Methods
This retrospective cohort study, conducted at a single medical center in Taiwan, enrolled patients over 18 years with T2DM who received subcutaneous semaglutide and those who were on linagliptin as the control group. The period of data collection was between January 1, 2021, and January 1, 2024. Demographic profile and laboratory data were obtained from electronic medical records (EMR). All patients were followed for estimated glomerular filtration rate (eGFR), urine albumin-creatinine ratio (uACR), and mortality for 9 months. Univariate and multivariate logistic regression model, along with time-course comparisons, were performed to identify risk factors for CKD progression and assess the association between semaglutide and the outcomes of interest.

Results
This retrospective cohort study included 1494 patients with T2DM. Patients treated with semaglutide (n=747) were matched to those receiving a DPP4 inhibitor, linagliptin (n=747), based on age, sex, renal function, and baseline HbA1c levels. Multivariate logistic regression model revealed that semaglutide was independently associated with a lower risk of eGFR decline (OR 0.7, 95% CI 0.5–0.8; $p < 0.01$) over the 9-month follow-up period. Additional factors independently associated with eGFR decline included hypertension (OR 1.3, 95% CI 1.0–1.6; $p = 0.01$) and higher urine albumin-creatinine ratio (OR 1.2, 95% CI 1.1–1.3; $p < 0.01$).
Regarding all-cause mortality at 9 months, semaglutide was associated with a significantly lower risk in multivariate logistic regression model (OR 0.2, 95% CI 0.1–1.0; $p = 0.05$); Age (OR 2.5, 95% CI 1.4–4.4; $p < 0.01$), dyslipidemia (OR 0.2, 95% CI 0.1–0.8; $p = 0.02$), and albumin levels (OR 0.1, 95% CI 0.1–0.2; $p < 0.01$) were also independently associated with mortality. Interestingly, uACR and heart failure showed trends towards significance, nevertheless, these did not reach statistical significance in the multivariate model.

Conclusion
In this study, semaglutide shows the potential on stabilizing renal function and lowering mortality

in patients with T2DM. This study supports the broader use of semaglutide in this high-risk population; however, long-term studies are warranted to confirm its effects on proteinuria.

原著論文 113_A43

1-Aminopyrene 經由焦亡相關的發炎小體引發血管內皮功能障礙

1-Aminopyrene-induced Vascular endothelial dysfunction through pyroptosis-related inflammasome pathway

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Background
The integrity of vascular endothelium is crucial for cardiovascular health, and dysfunction is an early step in conditions like atherosclerosis and hypertension. 1-aminopyrene (1-AP), an environmental pollutant from organic material combustion, induces oxidative stress and activates the inflammasome pathway, leading to pyroptosis and inflammatory signaling that exacerbates endothelial injury. However, the pyroptosis-related inflammasome pathway in which toxicity of 1-aminopyrine affects Vascular endothelial dysfunction is still not completely understood.

Methods
In this study, we utilized cellular mechanisms in SVEC4-10 endothelial cells. Cellular assays comprised treating SVEC4-10 cells with 1-aminopyrine at concentrations of 0, 10, 20, 30, and 40 μM for 24h to evaluate vascular endothelial permeability in Transwell setups using the Transepithelial electrical resistance (TEER) measurements and trans-endothelial albumin passage. Additionally, we employed ELISA assays to examine proinflammatory cytokines generation. Protein expression and phosphorylation were assessed through immunoblotting.

Results
At concentrations starting at 3 μM ($P < 0.05$), 1-aminopyrine caused a concentration-dependent increase in vascular endothelial permeability and the generation of proinflammatory cytokines, including interleukin (IL)-1β, IL-6, and tumor necrosis factor (TNF)-α in SVEC4-10 cells. Additionally, it led to the downregulation of the phosphorylation of NOD-, LRR- and pyrin domain-containing protein (NLRP)-3 and ASC, as well as the expression of Akt and Nuclear factor (NF)-κB in SVEC4-10 cells.

Conclusion
Based on these findings, it can be inferred that 1-aminopyrine induces vascular endothelial dysfunction through the pyroptosis-related inflammasome pathway via the NF-κB-mediated proinflammatory pathway.

原著論文 113_A44

非維生素 K 拮抗劑之口服抗凝劑對於陣發性與持續性心房顫動患者關於缺血性中風與顱內出血之影響：一全國性基礎世代研究

The Impact of Ischemic Stroke and Intracerebral Hemorrhage with Non-Vitamin K Antagonist Oral Anticoagulants in Patients with Paroxysmal and Persistent Atrial Fibrillation: A Nationwide Cohort Study

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Background

Current guidelines recommend oral anticoagulants (OACs) for CHADS2 and CHA2DS2-VASc scores of 2 or higher, irrespective of the subtype of paroxysmal atrial fibrillation (PRX AF) or persistent atrial fibrillation (PRS AF). However, increasing evidence suggests a relationship between atrial fibrillation (AF) burden and stroke risk. The likelihood of ischemic stroke events occurring in PRX AF may be lower than in PRS AF. Nevertheless, it is still necessary to consider the bleeding risk associated with the use of OACs. This study aims to assess the impact of nonvitamin K antagonist OACs (NOACs) treatment on ischemic stroke events and intracerebral hemorrhage (ICH) risk, as well as to determine the overall net clinical benefits in populations with PRX AF and PRS AF.

Methods

This study adopted a retrospective design and employed a population-based cohort approach, utilizing Taiwan's National Health Insurance Research Database (NHIRD) spanning the years 2014 to 2019. The cohort consisted of patients who received a new diagnosis of AF. Various endpoints were assessed, including the risk of ischemic stroke, all-cause mortality, myocardial infarction, and a composite of thromboembolic events. These assessments were conducted within groups categorized as paroxysmal AF or non-paroxysmal AF, with each group further subdivided based on treatment with NOACs or antiplatelet/warfarin. The safety endpoint encompassed the incidence of intracranial hemorrhage (ICH).

Results

Compared with those treated with non-NOACs therapy, individuals with PRX AF receiving NOACs treatment demonstrated a significant reduction in the risk of ischemic stroke (weighted hazard ratio: 0.86, 95% confidence interval: 0.78-0.94, p=0.0015), while showing no significant difference in the risk of intracerebral hemorrhage (ICH) (weighted hazard ratio: 1.0, 95% confidence interval: 0.87-1.16, p=0.9591). In PRS AF, NOACs treatment significantly lowered the risk of both ischemic stroke (weighted hazard ratio: 0.85, 95% CI: 0.77-0.93, p=0.0008) and ICH (weighted hazard ratio: 0.86, 95% confidence interval: 0.74-0.99, p=0.0445). In both PRX AF and PRS AF cohorts, individuals using NOACs exhibited decreased probabilities of all-cause mortality, thromboembolic events, and myocardial infarction compared to the control groups. Furthermore, both PRX AF and PRS AF groups receiving NOACs therapy demonstrated a positive net clinical benefit (NCB) when balancing ischemic stroke reduction against a weighted risk of ICH, in contrast to those receiving non-NOACs therapy.

Conclusion

Among patients with both PRX AF and PRS AF, those treated with NOACs exhibited a significant reduction in ischemic stroke risk. In PRS AF, NOACs treatment demonstrated a significant reduction in ICH compared to the non-NOACs group, while the effect on ICH was neutral in the PRX AF group treated with NOACs compared to their respective control group. Both PRX AF and PRS AF groups treated with NOACs showed a positive net clinical benefit. Therefore, for patients with either PRX AF or PRS AF, the use of NOACs is recommended as a choice to reduce ischemic stroke and mitigate bleeding risks.

原著論文 113_A45

Tirzepatide 與自殺風險在現實世界隊列研究中的關聯性

Association of Tirzepatide and the Risk of Suicide in a Real-World Cohort

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Background

Glucagon-like peptide 1 receptor (GLP1R) agonists have recently been reported to increase suicidal ideation and have come under the attention of the U.S. Food and Drug Administration (FDA) and the European Medicines Agency (EMA). Tirzepatide, a new dual agonist of GIP and GLP-1 receptors, has shown efficacy in weight management and diabetes but has been linked to reports of suicidal ideation, prompting further investigation.

Methods

This study aimed to assess the association between Tirzepatide and the risk of suicidal ideation using real-world data from the TriNetX electronic health record database based on the Research US Collaborative Network. A retrospective cohort study was conducted, including 226,060 patients diagnosed with overweight or obesity, who were prescribed either Tirzepatide or non-GLP1R agonist anti-obesity medications between May 1, 2022, and October 31, 2023. Patients with a prior history of suicidal ideation or suicide attempt were excluded.

Results

The primary outcome was the first occurrence of suicidal ideation within one year of the index event. Propensity score matching was performed, yielding two groups: 16,321 patients in the Tirzepatide group and 16,321 in the non-GLP1R agonist medication group. After matching, females accounted for 68.9% in the Tirzepatide group and 69.1% in the non-GLP1R agonist anti-obesity medications group; Not Hispanic or Latino accounted for 68.8% in the Tirzepatide group and 69.5% in the non-GLP1R agonist anti-obesity medications group. Results showed a significantly lower incidence of suicidal ideation in the Tirzepatide group compared to the non-GLP1R agonist group (0.12% vs. 0.24%; HR = 0.507, 95% CI = 0.282–0.910). No suicide attempts were reported in either group during the follow-up period. Subgroup analyses indicated a pronounced protective effect of Tirzepatide in females, white, not Hispanic or Latino, patients aged 45-64.

Conclusion

The study concluded that there is no increased risk of suicidal ideation associated with Tirzepatide, and it may even reduce the risk compared to other non-GLP1R anti-obesity medications. However, as a retrospective observational study, it is subject to certain limitations, including potential biases and the inability to establish causal relationships. Further prospective studies are required to confirm these findings.

原著論文 113_A46

經皮冠狀動脈介入術與冠狀動脈繞道手術在多支冠狀動脈疾病患者中的長期死亡率和併發症比較：一基於真實世界數據之研究

Comparison of Long-term Mortality and Morbidity between Percutaneous Coronary Intervention (PCI) and Coronary Artery Bypass Grafting (CABG) in Patients with Multivessel Coronary Artery Disease: Insights from Real-World Data

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Background

For patients with coronary artery disease and multiple vessel disease requiring revascularization, treatment options include percutaneous coronary intervention (PCI) and coronary artery bypass grafting. According to the 2021 guidelines from the American Heart Association/American College of Cardiology (AHA/ACC), CABG is generally recommended for patients with multiple vessel disease, especially those with diabetes, left main disease, or left ventricular dysfunction. Similarly, the 2023 guidelines from the European Society of Cardiology (ESC) recommend CABG for high-risk patients, such as those with diabetes or left main disease, while PCI may be considered for lower-risk patients. Additionally, the SYNTAX scoring system is used to assess the complexity of coronary lesions, with higher scores favoring CABG. Research also shows that CABG significantly reduces long-term mortality and myocardial infarction risks and decreases the need for repeat revascularizations. CABG is highlighted for its superior long-term outcomes, particularly in patients with diabetes and left ventricular dysfunction.

However, in real-world settings, patients with CAD and multiple vessel disease are often older and have multiple comorbidities. PCI is generally preferred by patients due to its smaller incision size and shorter hospital stay, making it more acceptable. Therefore, this study aims to analyze the clinical outcomes of PCI versus CABG in real-world patients with CAD and multiple vessel disease.

Methods

This study used the Longitudinal Health Insurance Research Dataset 2000 (LHIRD 2000), covering the period from 1997 to 2013. The study included 12,545 patients who underwent either PCI or CABG for multiple vessel coronary revascularization between 1998 and 2013. Patients were excluded if they had their first intervention before 2002 or after 2012, underwent both PCI and CABG within 90 days, died within 90 days of the first intervention, or did not receive antiplatelet therapy within 28 days of the index procedure.

The final cohort consisted of 7,690 PCI patients and 1,194 CABG patients, with a subset of 2,406 multivessel PCI patients and 1,109 multivessel CABG patients. A propensity score matching (PSM) approach was applied to create balanced cohorts of 519 PCI and 519 CABG patients, matched by factors such as age, sex, urbanization, hospital stay length, comorbidities, and co-medications within one year prior to the index procedure.

Results

Before PSM, the mortality rate for the PCI group was 4.69 per 1,000 person-months, while for the

CABG group, it was 5.52 per 1,000 person-months, with an adjusted hazard ratio (aHR) of 1.075 (95% CI: 0.940–1.230). After PSM, the mortality rate for the PCI group was 5.33 per 1,000 person-months, and for the CABG group, it was 5.47 per 1,000 person-months, with an aHR of 1.091 (95% CI: 0.873–1.363), showing no significant difference in mortality between PCI and CABG after matching.
The analysis of subgroups, such as age, sex, and the number of vessels involved, also revealed no significant interactions between the two interventions. However, CABG patients tended to have a slightly higher mortality rate, particularly among those with more complex vessel disease, though this was not statistically significant.

Conclusion

Our study found that there was no significant difference in long-term mortality between patients receiving PCI or CABG for multiple vessel disease, particularly after propensity score matching. While CABG was traditionally considered the more invasive yet superior option for patients with complex coronary disease, PCI provided comparable outcomes in this real-world cohort. Therefore, PCI may be considered a valid alternative to CABG in multivessel revascularization, especially for patients with comorbidities or those at higher surgical risk. Further research is needed to confirm these findings in larger, randomized trials.

原著論文 113_A47

探討植化素抑制糖脂毒性誘導血管平滑肌細胞遷移及血管內皮細胞發炎小體之活化作用

Effect of Phytochemicals on Glucolipotoxicity-Induced Vascular Smooth Muscle Cell Migration and Endothelial Cell Inflammasome Activation

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Background

Glucolipotoxicity, a metabolic condition arising from excessive glucose and lipid metabolites, is a key factor in the progression of type 2 diabetes and its associated complications. It is particularly linked to visceral adiposity, which leads to insulin resistance and insufficient insulin secretion due to pancreatic β-cell dysfunction. Additionally, diabetic patients face a significant risk of cardiovascular disease (CVD), primarily due to atherosclerosis. Atherosclerosis is driven by endothelial cell (EC) and vascular smooth muscle cell (VSMC) dysfunction, exacerbated by factors such as oxidative stress and inflammation. There is growing interest in natural compounds, particularly phytochemicals, for their potential to counteract glucolipotoxicity. Neo-chlorogenic acid (nCGA), a flavonoid with antioxidant and anti-obesity properties, has emerged as a promising candidate for mitigating vascular complications in diabetes.

Methods

This study investigates the protective effects of nCGA against glucolipotoxicity-induced atherosclerosis using in vitro models where vascular endothelial cells (E.Ahy926) and vascular smooth muscle cells (A7r5) are exposed to high levels of oleic acid and glucose to simulate diabetic vascular conditions. The experimental approach includes the use of gelatin zymography and PI staining to assess vascular smooth muscle cell migration and proliferation, DCFDA and JC-1 staining to evaluate oxidative stress and mitochondrial activity in endothelial cells, and Western blotting to analyze the involvement of pathways related to cell migration, proliferation, inflammasome activation, and apoptosis.

Results

The results are anticipated to show that nCGA reduces glucolipotoxicity-induced endothelial dysfunction and VSMC proliferation. The nCGA treatment may also attenuate oxidative stress, inhibit the NLRP3 inflammasome activation, and prevent the transformation of macrophages into foam cells, thus reducing plaque formation in the atherosclerotic process. These effects would demonstrate the phytochemical's potential in modulating key pathways involved in the vascular complications of type 2 diabetes.

Conclusion

The study aims to reveal the mechanisms through which nCGA may offer protection against glucolipotoxicity-induced atherosclerosis, providing insights into novel therapeutic strategies for preventing and managing cardiovascular complications in diabetic patients. If successful, nCGA could serve as a potential therapeutic agent to combat the vascular damage caused by diabetic

metabolic disorders.

原著論文 113_A48

使用 Prasugrel 進行長期與短期雙重抗血小板治療於經皮冠狀動脈介入術患者之臨床結果：回溯性研究

Clinical Outcomes of Long vs. Short Duration Dual Antiplatelet Therapy with Prasugrel in Patients Undergoing Percutaneous Coronary Intervention: A Retrospective Study

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Background
Dual antiplatelet therapy (DAPT), consisting of aspirin and a P2Y12 receptor inhibitor, is the standard treatment for patients undergoing percutaneous coronary intervention (PCI). Shorter durations of DAPT may be considered in patients with high bleeding risk. The PENDULUM Mono study, conducted in Japan, explored short-term DAPT followed by Prasugrel monotherapy in high-bleeding-risk PCI patients. The study showed promising results with reduced bleeding rates without increasing thrombotic risks, particularly in older populations with multiple comorbidities. Our study aims to investigate the clinical outcomes of long DAPT versus short DAPT, specifically focusing on Prasugrel-based therapy in patients who are at higher risk for both thrombotic events and bleeding.

Methods
This study is a retrospective analysis based on data collected from 10 medical centers in Taiwan. We enrolled patients diagnosed with coronary artery disease (CAD). All patients had undergone PCI with stent implantation and received prasugrel therapy. Patients were classified into two groups based on the duration of DAPT: 1. Long duration DAPT: DAPT with aspirin and prasugrel for 12 months or more. 2.Short duration DAPT: DAPT with aspirin and prasugrel for less than 12 months. Major adverse cardiovascular events (MACE), such as all-cause mortality, stroke, myocardial infarction, unplanned revascularization, and major bleeding events, were recorded.
The primary outcome was the incidence of MACE, while secondary outcomes included all-cause mortality, recurrent ACS or unplanned revascularization, stroke, stent thrombosis, and rehospitalization due to heart failure. Safety outcomes, particularly bleeding events classified as BARC 3 or higher, were also analyzed.

Results
At the 7-12 months follow-up, the long DAPT group continued to experience more major adverse events and stent thrombosis, along with a slight increase in rehospitalizations and all-cause deaths, though the differences were insignificant.
In terms of bleeding complications, the incidence was higher in the long DAPT group. Specifically, 3.95% of patients in the long DAPT group experienced bleeding, while only 1.61% of patients in the short DAPT group had bleeding events.

Conclusion
In this retrospective study, there was no significant difference in MACE between the two groups.

However, the incidence of bleeding was notably lower in the short DAPT group compared to the long DAPT group. These results suggest that short-term DAPT may provide a favorable balance by reducing bleeding risk without significantly increasing ischemic events.

原著論文 113_A49

某醫學中心 12 年收集臨床侵襲性金黃色葡萄球菌對甲氧西林藥物敏感性表現型與基因分型相關性 (2011-2022)

Genotypes and oxacillin susceptibility of invasive *Staphylococcuss aureus* clinical isolates from a medical center (2011-2022)

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Background

Invasive infections caused by *Staphylococcus aureus*, including methicillin-susceptible (MSSA) and resistant *S. aureus* (MRSA), lead to significant morbidity and mortality. Genotyping using the staphylococcal cassette chromosome *mec* (SCC*mec*) has been universally used for prediting the MRSA clones. The goal of this study was to delineate the molecular typing results of and to correlate these with oxacillin susceptibility.

Methods

Non-duplicate *S. aureus* isolates from patients with invasive infections were collected from a 12-year longidutinal study conducted in a medical center. Oxacillin-resistance to *S. aureus* (ORSA) was determined with the breakpoint of 2 mg/L using agar dilution according to the Clinical and Laboratory Standards Institute (CLSI). Methicillin-resistant *S. aureus* (MRSA) was confirmed with *mecA* existence. Isolates identified with *mecA* gene and susceptibility to oxacillin (oxacillin MIC≦ 2 mg/L) were oxacillin-susceptible MRSA (*mecA* + OSSA). The SCC*mec* type of each isolate was classified using multiplx polymerase chain reaction (M-PCR). Molecularly community-associated MRSA (CA-MRSA) were defined as isolates with SCC*mec*IV and V, while the healthcare-associated MRSA (HA-MRSA) included SCC*mec*I, II, and III. The gene (*pvl*) encoding Phanton-Valentine leukocidin was tested with PCR.

Results

In total, 940 invasive *S. aureus*, including 502 *mecA*+MRSA and 438 *mecA*-MSSA were identified. Most isolates were isolated from blood (826, 87.9%), followed by bronchoalveolar lavage (59, 6.3%), pleural effusions (17, 1.8%), ascites (16, 1.7%), synovial fluid (11, 1.2%), cerebrospinal fluid (9, 1.0%), and others (2, 0.2%). The numbers (percentages) of *mecA*+ ORSA/*mecA*- OSSA/*mecA*+ OSSA/*mecA*- OSSA were 412 (43.8%)/424 (45.1%)/90 (9.6%)/14 (1.5%), respectively. The *mecA*+ OSSA but not all OSSA was significantly associated with CA-MRSA (p<0.001 vs. p= 0.37). Most MRSA belonged to CA-MRSA (338, 67.3%), followed by HA-MRSA (134, 26.7%), and untypable isolates (30, 6.0%). The *pvl* gene existence was identified with significant association with MRSA and CA-MRSA (both p<0.001).

Conclusion

Genotyping MRSA with SCC*mec* can differentiate MRSA isolates for epidemiological purpose. The prevelences of MRSA decreases and that of CA-MRSA increases. The *mec*A+ OSSA and *pvl* genes were found more frequently in CA-MRSA. Those epidemologic and phenotypic characters may help

phycician select appropriate antibiotic regimens for treatment of severe sepsis caused by invasive *S. aurues*.

原著論文 113_A50

新診斷肢端肥大症患者於治療前之血糖恆定性

Glucose Homeostasis in Patients with Newly Diagnosed Acromegaly Before Treatment

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Background
Acromegaly, a rare endocrine disorder caused by excessive growth hormone, leads to impaired glucose metabolism, increasing the risk of diabetes and cardiovascular disease. Prediabetes and diabetes occur in 5-54.5% of cases, emphasizing the need for early diagnosis and monitoring to manage complications and reduce mortality.

Methods
The study encompasses patients diagnosed with acromegaly who underwent surgical interventions at Taipei Veterans General Hospital from 1977 to 2020. The data of growth hormone, IGF-1, fasting plasma glucose (PG), HbA1c and PG during OGTT were collected. Known Diabetes mellitus (DM) was defined as the use of anti-diabetic medication. Newly diagnosed DM was defined has any 1 of the following conditions: fasting plasma glucose ≧ 126 mg/dl, 2-hour glucose ≧ 200 mg/dl during OGTT, or HbA1c ≧ 6.5%. Normal glucose tolerance (NGT) was defined as fasting plasma glucose < 100 mg/dl and 2-hour glucose < 140 mg/dL during the OGTT and HbA1c < 5.7%, and without using anti-diabetic medication. Patients who did not meet the criteria for either DM or NGT were then classified as having prediabetes.

Results
Among the 177 patients studied, DM was diagnosed in 83 cases (46.9%), including 39 with pre-existing DM and 44 newly diagnosed. NGT was observed in 32 patients (18.1%), while 62 (35.0%) exhibited prediabetes. Among the individuals with prediabetes, impaired fasting glucose was identified in 59 individuals (36.4% of those had fasting blood glucose data), impaired glucose tolerance in 47 (30.5% of those had OGTT data), and HbA1c levels between 5.7 and 6.4% in 19 patients (25.0% of those had HbA1c data).

Conclusion
Our study comprehensively describes the diagnosis and prevalence of various blood glucose statuses in patients with newly diagnosed acromegaly. These findings may corroborate previous research or suggest novel mechanisms worthy of further investigation.

原著論文 113_A51

ANCA 相關血管炎腎炎患者罹患末期腎病變之風險探討

Risk of end-stage renal disease (ESRD) in ANCA-associated vasculitis glomerulonephritis (AAV-GN) patients

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Background
To determine the risk of end-stage renal disease (ESRD) in patients diagnosed with ANCA-associated vasculitis glomerulonephritis (AAV-GN) over a follow-up period of 52 weeks.

Methods
In this retrospective study, we recruited patients with biopsy-proven AAV-GN between 2010 and 2022. We documented baseline clinical characteristics and laboratory data, then analyzed risk factors contributing to ESRD.

Results
A total of 53 patients with AAV-GN (male ratio 54.7%, mean age 53 years old) were enrolled. The mean creatinine level was 3.7mg/dL. A significant majority, 52 (98.1%), tested positive for ANCA autoantibodies, including 45 (84.9%) P-ANCA and 7 (13.2%) C-ANCA. Of all patients, 32 (60.4%) underwent cyclophosphamide treatment, 26 (49.1%) rituximab, and 21 (39.6%) plasmapheresis. During the mean follow-up period of 40 weeks, 13 (24.5%) patients progressed to ESRD. All patients presented with at least one pathohistological manifestation of tubulointerstitial change. According to multivariate Cox regression analysis, the risk factors for ESRD included elevated serum creatinine levels (Hazard ratio [HR] 1.3, 95% confidence interval [CI] 1.06-1.60, p=0.012), complement C4 below 10mg/dL (HR 5.6, 95% CI 1.05-29.97, p=0.043), and elevated tubular atrophy scores (HR 3.3, 95% CI 1.20-8.98, p=0.020).

Conclusion
A high incidence rate of ESRD was observed in patients with AAV-GN. Risk factors identified include increased serum creatinine levels, low complement C4, and high tubular atrophy scores. Aggressive treatment should be considered in the high-risk patients.

原著論文 113_A52

對於免疫療法治療失敗後的頭頸癌病患結合免疫療法及抗表皮生長因子受體療法之療效評估

Combination of immunotherapy and anti-EGFR agents in immunotherapy refractory head neck cancer

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Background
Immunotherapy is the current standard first line treatment in recurrent and metastatic head neck squamous cell carcinoma (R/M HNSCC). However, a significant proportion of patient will fail the standard treatment and the prognosis is grave. Hence, in this study, we aim to evaluate the treatment efficacy of immunotherapy and anti-EGFR agents combination in immunotherapy refractory head neck cancer .

Methods
Immunotherapy refractory R/M HNSCC patients who had received anti-EGFR agents treatment during January 2020 to July 2024 has been screened. Patients who received immunotherapy and anti-EGFR agents combination therapy were selected for further analysis. The clinical features, treatment response, and survival outcomes had been evaluated.

Results
Totally 11 patients were eligible to be included in our study. Before undergoing combination therapy, these patients had received first line or second line treatment. The average of treatment line is 1.5. The overall response rate was 19%, with 2 patients in partial regression. The disease control rate was 73% (8/11) . The median progression free survival (mPFS) was 2.96 months, and the median overall survival (mOS) was 7.6 months. The median of duration response was (DoR) was 13 months. Here, we define mPFS2 and mOS2 as the duration from front line immunotherapy to disease progression/ death of subsequent immunotherapy-anti-EGFR agents combination. mPFS2 was 7.6 months and mOS2 was 10.1 months. This regimen was tolerable. The most common adverse events were decreased appetite, weight loss, diarrhea, fatigue, hypokalemia, cough, and hypothyroidism.

Conclusion
Based on our studies, combination immunotherapy and anti-EGFR agents is well tolerated and may provide as a feasible treatment option in immunotherapy refractory R/M HNSCC.

原著論文 113_A53

GLP-1 受體促效劑對脂肪肝與糖尿病病患的肝臟預後

Liver Outcomes of GLP-1 Receptor Agonists in Individuals with Nonalcoholic Fatty Liver Disease and Type 2 Diabetes: A Population-Based Matched Cohort Study

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Background
Anti-diabetic drugs, particularly glucagon-like peptide-1 (GLP-1) receptor agonists and sodium-glucose cotransporter-2 (SGLT2) inhibitors, have garnered significant interest for the treatment of nonalcoholic fatty liver disease (NAFLD) due to its strong association with metabolic syndrome. Despite promising results from clinical trials, evaluating anti-fibrotic benefits and long-term liver outcomes has proven challenging because of the low event rates and slow progression of the disease. In our study, we assessed major adverse liver outcomes (MALO) among new users of GLP-1 receptor agonists versus SGLT2 inhibitors in a large, population-based matched cohort analysis.

Methods
This multicenter retrospective cohort study utilized the TriNetX Research Network database, involving individuals aged 18 years or older with type 2 diabetes (T2D) and NAFLD who initiated GLP-1 receptor agonists or SGLT2 inhibitors between January 1, 2010, and June 1, 2023. Participants with a history of chronic liver disease other than NAFLD/nonalcoholic steatohepatitis (NASH) were excluded. The primary outcome was MALO, defined as a composite of decompensated cirrhosis events, hepatocellular carcinoma (HCC), and liver transplant. Secondary outcomes included the individual components of the primary outcome, all-cause mortality, and the specific components of decompensated cirrhosis events, such as variceal bleeding, hepatic encephalopathy, and complications related to ascites. Cox regression models were employed to estimate hazard ratios (HRs), using propensity score weighting to control for confounding variables.

Results
Among 16,709 matched pairs, users of GLP-1 receptor agonists had a lower risk of MALO compared to users of SGLT2 inhibitors (adjusted incidence rate: 92.1 vs. 109.4 events per 10,000 person-years; adjusted HR: 0.839, 95% CI: 0.733–0.961). In secondary outcome analyses, GLP-1 receptor agonist users exhibited reduced risks of decompensated cirrhosis events (adjusted HR: 0.833, 95% CI: 0.723–0.959) and all-cause mortality (adjusted HR: 0.816, 95% CI: 0.736–0.905).

Conclusion
The use of GLP-1 receptor agonists was associated with a significantly reduced risk of major adverse liver outcomes (MALO), primarily driven by a reduction in decompensated cirrhosis events.

原著論文 113_A54

幽門螺旋桿菌血清陽性與美國成年人全因死亡及心血管死亡風險之相關性

Association of Helicobacter pylori seropositivity with risk of all-cause and cardiovascular mortality in U.S. adults

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Background

The relationship between Helicobacter pylori (H. pylori) infection and the risk of cardiovascular disease (CVD) and all-cause mortality remains inconclusive. While some observational studies suggested that H. pylori infection may increase the risk of death from all causes and CVD, others have not supported this association. Given these conflicting findings, we conducted this study to better understand the association between H. pylori infection and all-cause and CVD mortality using a nationally representative sample of U.S. adults.

Methods

We analyzed data from the 1999–2000 U.S. National Health and Nutrition Examination Survey (NHANES), including 3,548 adults aged 18 to 65 years who underwent serum H. pylori IgG testing. Seropositivity was determined using a commercial IgG ELISA assay (Pyloristat, Wampole Laboratories, Cranbury, NJ), with an immune status ratio (ISR) 1.10 indicating H. pylori infection. Mortality outcomes were ascertained by linking NHANES data to the National Death Index, with follow-up through December 31, 2019.

Results

Among 3,548 participants, 1,416 (weighted prevalence: 27.6%) tested positive for H. pylori. Individuals with H. pylori were more likely to be older, non-White (Black or Hispanic), have lower educational attainment, lower income, and a higher prevalence of diabetes, hypertension, and CVD. Logistic regression identified older age, non-White race, smoking, lower education, married status, and lower family income as risk factors for H. pylori infection.

Over a median follow-up of 239 months (IQR: 233-244), 448 participants died (5.6 deaths per 10,000 person-months). Kaplan-Meier analysis showed a significant association between H. pylori infection and all-cause mortality ($p < 0.001$) as well as CVD mortality ($p < 0.01$). In multivariable Cox regression models adjusted for age, sex, race, BMI, smoking, education, marital status, family income, and comorbidities, H. pylori infection was associated with a 51% higher risk of all-cause mortality (HR: 1.51, 95% CI: 1.13–2.01). Although the association with CVD mortality (HR: 1.41, 95% CI: 0.79–2.49) did not reach statistical significance, the trend suggests increased risk.

Conclusion

H. pylori infection is significantly associated with an elevated risk of long-term all-cause mortality in U.S. adults. Although the association with CVD mortality did not reach statistical significance, the trend towards increased risk warrants further exploration. These findings underscore the potential role of H. pylori as a modifiable risk factor and the need for further studies to elucidate

the mechanisms underlying this relationship.

原著論文 113_A55

美國一般人群中 C 反應蛋白和高敏感度肌鈣蛋白 I 作為死亡率預測因子之研究

C-Reactive Protein and High-Sensitivity Troponin I as Predictors of Mortality in the U.S. General Population

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Background
C-reactive protein (CRP), an inflammation marker, and high-sensitivity troponin I (hs-TnI), a marker of subclinical myocardial injury, have been linked to increased risks of adverse outcomes in both cardiovascular disease patients and the general population. However, their relative prognostic value for predicting mortality remains unclear. To address this gap, we conducted a population-based study to evaluate the independent and combined prognostic utility of CRP and hs-TnI in predicting mortality risk.
Method

Methods
We utilized data from the 1999–2004 National Health and Nutrition Examination Survey (NHANES), including 13,033 adults aged 18 years and older who had serum CRP and hs-TnI measurements. Individuals were excluded if they self-reported a history of coronary artery disease, heart failure, angina, heart attack, stroke, had an estimated glomerular filtration rate (eGFR) <60 mL/min/1.73 m^2, or had undergone dialysis within the past 12 months. hs-TnI was measured using the Abbott ARCHITECT i2000SR, and CRP was assessed via latex-enhanced nephelometry. Mortality status was determined by linking NHANES data to National Death Index records. Participants were followed until death or December 31, 2019.

Results
The final cohort included 9,634 participants (mean age 43.8±0.3 years, 48.8% male, 76% White, 10.8% Black, 13.9% Hispanic). Elevated CRP levels were associated with older age, female sex, Black race, lower educational attainment, lower family income, higher body mass index (BMI), smoking, diabetes, and hypertension. Elevated hs-TnI levels correlated with older age, male sex, Black race, hypertension, higher BMI, and elevated CRP levels. Participants in the highest hs-TnI quartile had significantly higher risks of all-cause mortality (HR 1.43, 95% CI 1.09-1.80, $p < 0.05$) and cardiovascular mortality (HR 2.28, 95% CI 1.09-4.77, $p < 0.05$) compared to the lowest quartile. Similarly, individuals with CRP >3 mg/L had increased risks of all-cause mortality (HR 1.50, 95% CI 1.25-1.80, $p < 0.001$) and cardiovascular mortality (HR 1.49, 95% CI 1.06-2.07, $p < 0.05$) compared to those with CRP <1 mg/L. While participants with elevated levels of both biomarkers had a higher risk of all-cause mortality, no significant synergistic effect was observed.

Conclusion
In this population-based study, both hs-TnI and CRP were independently associated with increased risks of all-cause and cardiovascular-related mortality. These biomarkers offer

additional prognostic value beyond traditional risk factors, highlighting the roles of subclinical myocardial injury and inflammation in mortality risk stratification. Further research is needed to explore their clinical utility in enhancing predictive models.

原著論文 113_A56

使用年齡調整後 NT-proBNP 臨界值診斷的心臟衰竭與美國一般人口長期死亡率的相關性

Association of Age-Adjusted NT-proBNP Cutoff-Diagnosed Heart Failure with Long-Term Mortality in the U.S. General Population

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Background

In 2023, the Heart Failure Association of the European Society of Cardiology (ESC) introduced age-adjusted NT-proBNP cutoff levels to improve the diagnosis of de novo heart failure in the outpatient setting. These cutoffs account for the natural age-related increase in NT-proBNP levels. Although elevated NT-proBNP is a known predictor of long-term mortality, the prognostic value of age-adjusted thresholds remains insufficiently studied. This population-based study aimed to assess the utility of age-adjusted NT-proBNP cutoffs in predicting long-term mortality in the U.S. general population.

Methods

We analyzed data from the 1999–2004 National Health and Nutrition Examination Survey (NHANES) in the U.S., including 10,484 adults aged ≧ 18 years with an estimated glomerular filtration rate (eGFR) ≧ 60 mL/min/1.73 m^2 who underwent serum NT-proBNP testing. NT-proBNP levels were measured using the Roche Cobas e601 autoanalyzer (Roche Diagnostics). Mortality status was ascertained by linking NHANES data to the National Death Index, with follow-up continuing until death or December 31, 2019.

Results

Among the 10,484 participants (mean age 45.1±0.3 years, 49.2% male, 72.3% White, 10.6% Black, 13.4% Hispanic), 8,402 (84.3%) were classified as “heart failure very unlikely,” 1,152 (7.6%) as “Grey zone (heart failure not likely),” and 930 (8.1%) as “heart failure likely or very high risk” based on ESC age-adjusted NT-proBNP cutoffs. The proportion of participants classified as “heart failure likely or very high risk” increased with age: 5.9% (n=281) of those <50 years, 10.4% (n=432) of those aged 50–74, and 20.9% (n=217) of those ≧75 years fell into this high-risk category. Multiple linear regression analysis showed that elevated NT-proBNP levels were significantly associated with older age, female sex, White race, higher urinary albumin-creatinine ratio (ACR), smoking, hypertension, and cardiovascular disease (CVD), while higher body mass index (BMI) and eGFR were associated with lower NT-proBNP levels. During a median follow-up of 215 months (IQR: 199-232), 2,646 participants died, corresponding to a mortality rate of 13.2 per 10,000 person-months. Kaplan-Meier analysis demonstrated that being classified as “heart failure likely or very high risk” was significantly associated with an increased risk of all-cause mortality ($p < 0.001$) and cardiovascular mortality ($p < 0.001$). In multivariable Cox regression models, adjusted for demographics (age, sex, race), BMI, comorbidities (diabetes, hypertension, CVD, previous stroke), smoking status, ACR, and eGFR, “heart failure likely or very high risk” status was associated with higher risks of all-cause mortality (HR: 1.91, 95% CI: 1.62–2.25) and cardiovascular mortality (HR:

2.67, 95% CI: 1.91–3.73). Even participants classified as "Grey zone (heart failure not likely)" showed increased risks of all-cause mortality (HR: 1.38, 95% CI: 1.21–1.58) and cardiovascular mortality (HR: 1.74, 95% CI: 1.33–2.28).

Conclusion

Age-adjusted NT-proBNP cutoff levels provide valuable prognostic insights for heart failure and are significantly associated with long-term all-cause and cardiovascular mortality. These findings underscore the clinical utility of incorporating age-specific NT-proBNP thresholds in heart failure risk assessments and highlight the need for further research in diverse populations to validate their broader prognostic value.

原著論文 113_A57

肝癌發生與復發的早期診斷，適當的治療與再治療，加上多專科團隊的診療獲致長期存活：可改變的醫療介入所扮演的角色

Early Detection occurrence and recurrence, Prompt Treatment and Re-treatment, and Multidisciplinary Care Result in Long-term of hepatocellular carcinoma: Roles of modifiable medical interventions

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Background
Most of hepatocellular carcinoma (HCC) practices guidelines provide same treatment algorithm for both newly occurrence and recurrence HCC. Most published survival analyses included only innate unmodifiable disease conditions as prognostic factors. To elucidate the usefulness of treatment algorism for recurrence HCC and to realize the role of modifiable medical interventions and multidisciplinary care, we conduct the retrospective observation study on early HCC patients with long-term survival.

Methods
During 2010 and 2020, a total 1462 patients with Barcelona Clinic Liver Cancer (BCLC) stage 0 and A were registered in the study hospital, and have been followed till the end of 2023. Among them, 79 (mean age: 64 years, M: F=56: 23) have survived for more than 10 years were recruited for this study. Tumor free survival (TFS) status was defined as tumor-free status after 3 or less treatments till the end of observation. Chi-square text with Yate's correction, Kaplan-Meier survival curve and Cox Hazard Model were employed for statistics analysis

Results
In the initial treatment, 39 (49.4%) out of 79 patients achieved TFS. The 40 recurrent cases, but 1 with stage progression, underwent 2nd treatment, and 16 (16/39=41.0%) achieved TFS. The 23 patients experienced 2nd recurrence, all but one with stage progression underwent the 3rd treatment, and 22.7% (5/22) achieved TFS. In the above mentioned 140 treatment, 98 curative treatment achieved 48 (49%) TFS, while 42 non-curative treatment achieved only 11(26.2%) TFS. (p=0.018). The other 19 patients without TFS were underwent multidisciplinary care, and their treatment course with shown by swimmer plot in the presentation. Five patients progressed to BCLC stage C during follow up, and 4 of them died with a median survival of 2 year after stage progression. In the Cox hazard model showed "underwent non-curative treatment" and "disease progression to BCLC stage C" were poor prognostic factors, while viral hepatitis with or without anti-viral therapy was not a significant factor.

Conclusion
Early detection of recurrence is a prognostic factor. Prompt treatment, i.e. curative treatment for early HCC, has significant higher rate of achieving TFS. Multidisciplinary treatment improved survival.

原著論文 113_A58

威爾遜氏症：以台灣中部單一醫學中心的病例係列

Wilson's disease: A case series of a single medical center hospital in Central Taiwan

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Background
Wilson's Disease (WD) is an inherited disorder affecting copper metabolism, resulting in pathological copper accumulation. Caused by mutations in ATP7B, it disrupts copper homeostasis, leading to overload in the liver, brain, and other organs. Clinical manifestations vary, including neurological and psychiatric symptoms. Treatment options involve chelation therapy and zinc salts, addressing copper overload through distinct mechanisms.

Methods
We obtained cases with diagnosis of Wilson disease at CCH from 2018 to 2023, and analyzed the medical records (including age, sex, Ceruloplasmin and response to medications) of these patient retrospectively.

Results
In this case series involving 21 patients, the age range spanned from 17 to 64 years, with 12 males and 9 females. The majority presented with predominant neurological symptoms, leading to continuous follow-up in the neurology department. Some cases progressed to liver cirrhosis. Especially the 64 years old patient had passed away due to acute fulminant hepatic faliure with decompensation, and multiple organ failure. Notably, one patient, post-liver transplantation, ceased medication use and exhibited stable symptomatology.
Ceruloplasmin levels in the existing patient cohort were uniformly below 13 mg/dL, with a significant proportion registering below 6 mg/dL, rendering precise numerical values indiscernible due to exam limitations. The mainstream therapeutic approach involved the use of zinc (Zn) and trientine, either in isolation or combination. Only two cases continued to receive penicillamine. Approximately one-third of the cases underwent genetic testing, revealing ATP7B mutations in the majority. The clinical efficacy and safety of the current therapeutic modalities, especially the continued use of penicillamine, report stable disease control and warrant further investigation in larger cohorts.

Conclusion
The cases emphasize the significance of neurology clinic monitoring and all have well control under current medication use with only few progress to liver cirrhosis and , in select instances, the potential for stabilizing symptoms post-liver transplantation without ongoing pharmacotherapy.
Liver biopsy for hepatic copper quatify is no more important currently compared with 24-hour urinary copper excretion, ceruloplasmin levels and genetic analysis of ATP7B.

原著論文 113_A59

藉由人工智慧演算法: U-Net 及卷積神經網路與腎臟超音波影像來識別慢性腎臟病分期

Identification of CKD stages by renal echo images with artificial intelligence algorithms: U-Net and convolutional neural network

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Background

Artificial intelligence algorithms have been widely applied in the field of medical image identification. In this study, we aim to leverage U-NET, a specialized convolutional neural network for image segmentation, and convolutional neural network (CNN) to thoroughly analyze renal ultrasound images and predict the stages of chronic kidney disease, improving diagnostic precision and treatment planning through a noninvasive method.

Methods

This is a retrospective study conducted between 2021 and 2024, including 509 cases, consisting of 1,018 kidney ultrasound images. The study population was 53% male, with a mean age of 68.7 ± 13.8 years. A total of 380 control renal ultrasound images (eGFR≧60) and 638 CKD stage III-V kidney ultrasound images were analyzed. Artificial intelligence algorithms by U-NET to segment kidneys from the image background and then convolutional neural network, were applied for image segmentation and analysis.

Results

Using U-NET and convolutional neural networks, our model achieved an 75% accuracy to predict CKD stages based on renal ultrasound images.

Conclusion

Combination of U-NET and CNN can predict CKD stages with kidney ultrasound images with reasonable accuracy.

原著論文 113_A60

牙周病作為脂肪肝的危險因子：根據內臟脂肪指數及非高密度脂蛋白膽固醇與高密度脂蛋白膽固醇比值的分層分析

Periodontitis as a risk factor for fatty liver disease: stratification by visceral adiposity index and non-high-density lipoprotein cholesterol to high-density lipoprotein cholesterol ratios

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Background
Previous studies have established a connection between periodontitis and metabolic diseases, including fatty liver disease. The visceral adiposity index (VAI) and the non-high-density lipoprotein cholesterol to high-density lipoprotein cholesterol ratio (NHHR) are non-invasive indicators that reflect levels of visceral fat. Although both indicators have been linked to metabolic disorders, their specific roles in the relationship between periodontitis and fatty liver disease have not been fully explored.

Methods
This study analyzed health examination data collected between 2012 and 2015 from a medical center in Taiwan, aiming to determine whether periodontitis is associated with fatty liver disease in the Taiwanese population, and to assess whether VAI and NHHR contribute to this association. A total of 5398 individuals were included in the study. Statistical analysis was calculated using Python software. The analysis involved univariate, multivariate, and ordinal logistic regression models to examine the relationships between periodontitis and fatty liver disease. Participants were stratified into tertiles based on their VAI and NHHR levels.

Results
After adjusting for other relevant covariates, a significant association between periodontitis and an increased risk of fatty liver disease was found. Notably, this increased risk was significant only in individuals with high VAI, while no significant association was observed with NHHR.

Conclusion
The findings from this study suggest that periodontitis is a risk factor for fatty liver disease, particularly in individuals with higher levels of visceral fat. The significant association observed between periodontitis and fatty liver disease in participants with elevated VAI highlights the importance of considering visceral adiposity in the management of both oral and metabolic health. Further research is needed to better understand the mechanisms underlying this relationship and to explore potential interventions aimed at reducing visceral fat in individuals with periodontitis.

原著論文 113_A61

利用人體幹細胞誘發心肌細胞研究糖引起的油傷害

Glucose-induced Lipotoxicity in hiPSC-Derived Cardiomyocytes

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Background
Induced pluripotent stem cell (iPSC) technology provides a versatile platform for applications in disease modeling, drug screening, tissue engineering, and stem cell therapy. Among these applications, human iPSC-derived cardiomyocytes (hiPSC-CMs) offer significant potential for studying diabetic cardiomyopathy, a condition characterized by cardiac dysfunction due to high glucose levels. Lipotoxicity in cardiomyocytes caused by elevated glucose contributes to changes in cell size, beating rate, calcium handling, and lipid accumulation. Therapeutic strategies that target these pathological changes are crucial for managing diabetic complications. Empagliflozin, a sodium-glucose cotransporter 2 (SGLT2) inhibitor, has demonstrated cardioprotective effects, making it a promising candidate for diabetic cardiomyopathy treatment.

Methods
To mimic the pathological conditions of diabetic cardiomyopathy in vitro, hiPSC-CMs were exposed to high glucose (HG) concentrations. Various cellular parameters, including cell size, beating rate, calcium transient dynamics, and lipid accumulation, were measured to assess HG-induced lipotoxicity. Empagliflozin was then introduced to the system to evaluate its ability to reverse these abnormalities. SGLT2 expression was also examined in cardiomyocytes under different glucose concentrations, with the aim of exploring its role in the development of diabetic cardiomyopathy.

Results
High glucose treatment led to hypertrophic changes in hiPSC-CMs, including increased cell size, disrupted calcium handling, impaired contractility, and elevated lipid accumulation. These changes reflect the typical features of diabetic cardiomyopathy. However, treatment with empagliflozin resulted in a significant reduction in cell hypertrophy, normalization of calcium transient dynamics, and restoration of contractility. Lipid accumulation was also reduced following empagliflozin treatment. Furthermore, glucose concentration was found to influence the expression of SGLT2 in cardiomyocytes, suggesting that SGLT2 plays a critical role in mediating the effects of high glucose in diabetic cardiomyopathy.

Conclusion

This study demonstrates the utility of hiPSC-derived cardiomyocytes in modeling diabetic cardiomyopathy and assessing therapeutic interventions. Empagliflozin effectively alleviated the adverse effects of high glucose on cardiomyocytes, highlighting its potential as a therapeutic agent in diabetic cardiomyopathy. By reducing hypertrophy, restoring normal calcium handling, and improving contractile function, empagliflozin offers promise for treating cardiac complications associated with diabetes. Additionally, the observed influence of glucose on SGLT2 expression in cardiomyocytes points to a critical role for this pathway in diabetic cardiomyopathy. These findings support the advancement of precision medicine approaches to improve outcomes in patients with diabetic cardiac complications.

原著論文 113_A62

甲狀腺功能減退患者服用甲狀腺素治療後，研究甲狀腺刺激素和游離甲狀腺素對心律事件的影響

The impact of thyroid stimulating hormone and free T4 level on arrhythmia event and outcomes in patients with clinical hypothyroidism under levothyroxine treatment

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Background

Hypothyroidism is a disorder in which the thyroid gland does not produce enough thyroid hormone. With reagard to the Cardiovascular system, hypothyroidism results in a decrease in cardiac output that is mediated by reductions in heart rate and contractility. Most people confirmed thyroxine deficiency are treated with a synthetic long-acting form of thyroxine, known as levothyroxine. However, some patient suffered from arrhythmia events under hormone replacement. This study was conducted to analyze the impact of thyroid stimulating hormone and free T4 level on arrhythmia event and outcomes in patients with clinical hypothyroidism under levothyroxine treatment.

Objectives

We aimed to realize the impact of thyroid stimulating hormone and free T4 level on arrhythmia event and outcomes in patients with clinical hypothyroidism under levothyroxine treatment.

Methods

Patient who had newly diagnosed hypothyroidism and had prescriptions for levothyroxine were identified from multi-institutional database in Taiwan from 2009 to 2019. Initially, our investigation will prioritize the examination of patients diagnosed with hypothyroidism and pre-existing history of cardiac arrhythmia will be systematically excluded from the study cohort. We aim to elucidate the potential impact of levothyroxine administration on the occurrence of arrhythmias within this patient population. Subsequently, our analysis will delineate the nuanced effects of age, medication dosage, and subsequent thyroid function (as indicated by TSH and free T4 levels) on the manifestation of arrhythmias among patients undergoing levothyroxine therapy. Our investigation encompasses a spectrum of arrhythmias, including atrial fibrillation, atrial flutter, supraventricular tachycardia, and ventricular tachycardia.

Results

Overall, in patients with hypothyroidism, supplementation with levothyroxine appears to decrease the probability of arrhythmia occurrence, including atrial fibrillation, supraventricular and ventricular tachycardia, though not significantly affecting atrial flutter. When analyzing the dosage of levothyroxine, compared to those not receiving levothyroxine supplementation, the overall risk of arrhythmia is reduced irrespective of the dosage. This phenomenon remains consistent in the subgroup analysis for atrial fibrillation. However, concerning atrial flutter and ventricular tachycardia, the use of levothyroxine, regardless of dosage, does not mitigate the risk of arrhythmia compared to those not using levothyroxine. Notably, in the analysis of the

supraventricular tachycardia subgroup, a dosage range between 75-125ug/day appears necessary to reduce the risk of arrhythmia. Regarding the overall incidence of arrhythmias, there is a correlation between increasing age and a higher occurrence of arrhythmias. However, this correlation is not evident for supraventricular tachycardia and ventricular tachycardia. In terms of thyroid function, as indicated by TSH and free T4 levels, does not significantly influence the overall incidence of arrhythmias. This observation holds true even in the subgroup analysis focusing on atrial fibrillation. In the subgroup analysis of atrial flutter, besides the age-related trend, individuals with free T4 levels between 0.7 and 1.48 exhibited a lower incidence compared to those with free T4 levels below 0.7. In the examination of supraventricular tachycardia, age was not a significant factor influencing incidence. However, individuals with elevated TSH levels (>4.94) exhibited a lower incidence compared to those with TSH levels below 0.35. Lastly, in the context of ventricular tachycardia, neither age nor thyroid function demonstrates a notable discrepancy in the incidence rate.

Conclusion

In the context of hypothyroidism, the administration of levothyroxine effectively decreases the overall incidence of arrhythmias. Furthermore, following levothyroxine supplementation, careful attention to dosage management and continuous monitoring of thyroid function are crucial in attenuating specific arrhythmia episodes.

原著論文 113_A63

心房顫動患者使用直接口服抗凝劑對比維生素 K 拮抗劑與發生大出血、心包填塞及心包積液之危險性比較

Meta-Analysis of Major Bleeding, Cardiac Tamponade, and Pericardial Effusion in Patients with Atrial Fibrillation During Catheter Ablation Treated with Direct Oral Anticoagulation or VKA

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Background

Atrial fibrillation (AF) is the most common heart arrhythmia, doubling mortality and fivefold stroke risk. AF is notably associated with thromboembolic stroke, leading to myocardial infarction and other thromboembolic events. Vitamin K antagonists (VKAs) used to be the standard way to prevent strokes after catheter ablation, but now direct oral anticoagulants (DOACs) like dabigatran, rivaroxaban, apixaban, and edoxaban are preferred because they are safer and work better. Some studies suggest that DOACs can significantly reduce the risk of major bleeding, while recent articles present conflicting perspectives. As no prior meta-analysis has focused on primary outcomes related to pericardial effusion and cardiac tamponade. Therefore, the goal of our study is to find out how VKAs and DOACs affect the risk of major bleeding, pericardial effusion, and cardiac tamponade in people with atrial fibrillation who have had catheter ablation.

Methods

We conducted a systematic search of PubMed and ClinicalTrials.gov for relevant articles or clinical trials in English up to April 10, 2024. We examined studies from two databases (PubMed and ClinicalTrials.gov) and identified the events of major bleeding, pericardial effusion, and cardiac tamponade during ablation in people with AF. Three authors independently extracted data, cross-checked it with two additional reviewers following Preferred Reporting Items for Systematic Reviews and Meta-analysis guidelines, and analyzed it using fixed and random effects models. The primary outcomes include major bleeding, pericardial effusion, and cardiac tamponade, while the secondary outcomes comprise stroke/thromboembolism, all-cause mortality, and cardiovascular death.

Results

We identified 45 studies encompassing 26,924 AF patients, including 8 randomized clinical trials and 37 observational studies. Four DOAC types: apixaban (18 studies), dabigatran (23 studies), edoxaban (8 studies), and rivaroxaban (19 studies). Some studies included more than one drug, all of which were published between 2012 and 2023. In this context, the experimental group and controls are defined as patients receiving DOAC and VKA therapies, respectively. Our results showed that DOACs were linked to reduced risks of major bleeding (RR = 0.72, 95% CI: 0.58-0.89) and cardiac tamponade (RR = 0.66, 95% CI: 0.49-0.88) in comparison to VKAs. No significant changes were observed in the probability of pericardial effusion (RR = 0.94, 95% CI: 0.61–1.45) or secondary outcomes. Network analysis showed dabigatran's superiority compared to VKAs in major bleeding (RR = 0.61, 95% CI: 0.46-0.82) and cardiac tamponade (RR = 0.59, 95% CI: 0.39-0.89).

Conclusion

We found that DOACs are much better than VKAs at reducing major bleeding and cardiac tamponade after ablation surgery. However, more research is needed to fully understand how DOACs and VKAs affect pericardial effusion. Our results specifically show that dabigatran may be considered the preferred anticoagulant for patients with atrial fibrillation undergoing ablation surgery.

原著論文 113_A64

TGF-β誘導心房組織之內皮細胞-間質細胞轉化與纖維化之分子機制研究

Investigating the molecular mechanism of TGF-beta-induced endothelial-to-mesenchymal transition and fibrosis in atrial tissues predict responsiveness to azacitidine in MDS and AML

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Background
The formation of cardiac fibroblasts via the endothelium-to-mesenchymal transition (EndMT) of endothelial cells, predominantly influenced by the transforming growth factor-β (TGF-β) signaling pathway, is a crucial mechanism in cardiac fibrosis. The dynamic molecular mechanisms regulating this route are still insufficiently comprehended, despite its key importance. This study aims to investigate the EndMT process induced by TGF-β. Our goal is to clarify the roles of endothelial cells and other cell types in the development of cardiac fibrosis, as well as to identify new therapeutic targets, by examining gene expression variations in the atrial and ventricular tissues during fibrosis.

Methods
Single-cell RNA sequencing (scRNA-seq) analysis was performed on atrial and ventricular tissue samples from wild-type and transgenic mice that overexpress the TGF-β gene, employing the 10× Genomics platform. The resultant FASTQ data were analyzed using the Cell Ranger software suite. Downstream analysis, including quality control, normalizing, SCTransform normalization, PCA, UMAP dimensionality reduction, and clustering, was executed using the Seurat package in R. Harmony was applied to merge the four sample sets and adjust for batch effects. Subsequent analyses include differential gene expression (DEG) analysis, trajectory analysis, and intercellular communication analysis.

Results
After quality control and filtration on single-cell RNA sequencing data from four sample sets, we successfully preserved 39,788 cells, including 11,300 from wild-type atrial samples (WTA), 9,286 from wild-type ventricular samples (WTV), 7,904 from transgenic atrial samples (TGA), and 11,298 from transgenic ventricular samples (TGV). Following data standardization, dimensionality reduction was performed via principal component analysis (PCA) and uniform manifold approximation and projection (UMAP). Harmony was subsequently used for batch effect correction, leading to the categorization of cells into 28 clusters. We mapped out the highly expressed genes in these 28 groups using marker genes found in previous research. This helped us identify 11 main types of cells: fibroblasts, endothelial cells, myeloid cells, B cells, T/NK cells, smooth muscle cells, cardiomyocytes, granulocytes, pericytes, Schwann cells, and epicardial cells. Fibroblasts served as the predominant cell type throughout all four sample groups, followed by endothelial cells and myeloid cells. We further classified fibroblast cells and found some of the subcluster were involved in the TGF-β signaling pathway, extracellular matrix (ECM) composition, and myocardial remodeling, contributing to the promotion of endothelial-to-mesenchymal transition (EndMT).

Conclusion

Our research indicates that the TGF-β signaling pathway is essential for the EndMT process, a significant contributor to heart fibrosis. Using single-cell RNA sequencing analysis, we discovered key cell types and gene expression patterns associated with this transformation. The prevalence of fibroblasts and their role in extracellular matrix composition and cardiac remodeling highlight their essential function in fibrosis. These findings improve our comprehension of the molecular pathways involved in cardiac fibrosis and highlight possible treatment strategies for relieving this medical condition.

原著論文 113_A65

局部晚期食道癌接受根治性化放療達到完全緩解病患之復發及危險因子分析

Patterns and Risk Factors for Recurrence in Patients with Locally Advanced Esophageal Cancer Achieving Complete Metabolic Response After Definitive Chemoradiotherapy

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Background

Esophageal cancer ranks sixth in incidence and fifth in mortality in Taiwan. Over 90% of esophageal cancer in east Asia is squamous cell carcinoma and was highly associated with carcinogen exposure. For locally advanced esophageal cancer patients who are not surgical candidates, definitive chemoradiotherapy (dCRT) remains the standard treatment. The success rate of achieving a clinical complete response (cCR) with dCRT ranges from 38% to 68%. Despite these promising response rates, recurrence is a significant concern, with 32% to 46% of patients experiencing disease relapse within three years. Locoregional recurrence is the most frequent pattern, typically occurring within the first two years after treatment. Given the high recurrence rates, particularly in the first three years post-treatment, this study aims to identify disease-related factors contributing to recurrence in esophageal cancer patients who achieve cCR following dCRT in Taiwan. Understanding these factors is crucial for improving long-term outcomes and guiding follow-up strategies.

Methods

This retrospective study was conducted at Kaohsiung Chang Gung Memorial Hospital between August 28, 2020, and December 12, 2023. Eligible patients included those with histologically confirmed squamous cell carcinoma of the esophagus who achieved a complete response (CR) following dCRT. The criteria for CR were defined as the absence of malignancy confirmed by endoscopic biopsy, no evidence of distant metastasis on positron emission tomography (PET), and a local standardized uptake value (SUV) of less than 4. All patients received definitive radiotherapy with a total dose exceeding 5000 cGy and had undergone at least one cycle of chemotherapy.
Patient data were collected on recurrence, specifically the timing of recurrence and whether it was locoregional or distant. Progression-free survival (PFS) was analyzed using Kaplan-Meier survival analysis, and Cox proportional hazards regression was employed to identify risk factors associated with PFS.

Results

The cohort consisted of 2 women and 43 men, with a median age of 57 years (range, 41-83). Staging included 2 patients with stage II, 18 with stage III, 16 with stage IVA, and 9 with stage IVB The median follow-up time was 20 months. Among the 45 patients who received concurrent chemoradiotherapy (CCRT), 42.2% (19 patients) experienced disease progression. Factors such as tumor stage, supraclavicular lymph node metastasis, tumor grade, post-treatment esophageal SUV, radiation dose, and the interval between diagnosis and radiation did not show statistically significant differences in tumor recurrence rates. Of the 45 patients, 12 (26.7%) were treated with

Cisplatin + 5-FU, while 33 (73.3%) received Paclitaxel + Cisplatin/Carboplatin. The Cox regression model indicated that the Cisplatin + 5-FU regimen was associated with superior progression-free survival compared to the Paclitaxel + Cisplatin/Carboplatin regimen (HR = 0.042, P = 0.036).

Conclusion

The choice of chemotherapy regimen is a significant prognostic factor for progression-free survival in patients with esophageal cancer achieved cCR after dCRT. Specifically, Cisplatin + 5-FU treatment was associated with improved progression-free survival compared to Paclitaxel + Cisplatin/Carboplatin. Other clinical and treatment-related variables did not significantly impact tumor recurrence rates.

原著論文 113_A66

在內科加護病房患者中體液過量與血清肌酸酐標準或尿液量標準定義之急性腎損傷獨立相關

Fluid Overload is Independently Associated with Acute Kidney Injury Defined by Serum Creatinine or Urine Output Criteria in Patients from Medical Intensive Care Units

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Background

In intensive care units (ICUs), acute kidney injury (AKI) is one of the most common complications. AKI could affect many clinical outcomes, such as short- and long-term morbidity and mortality. We intend to explore the relationship between urine output (UO) criteria or serum creatinine (SCr) criteria of AKI and disease outcomes in patients in ICUs.

Methods

Clinical data of patients admitted to our medical ICUs from 1st September, 2022 and 30th September, 2022 is collected. We exclude the patients who have had end stage renal disease, long-term renal replacement therapy, or were transferred from surgical department for quarantine due to newly diagnosed COVID-19. According to KDIGO Clinical Practice Guideline, AKI is defined as: (1) AKIcr - increase in SCr by 0.3 mg/dl within 48 hours; or increase in SCr to 1.5 times baseline, which is known or presumed to have occurred within the prior 7 days; or (2) AKIuo - UO <0.5 ml/kg/h for 6 hours. The combination of both criteria is AKIcruo. However, considering 8-hour shift in our ICU clinical practice, we adjusted 6 hours in urine output criteria to 8 hours. As one of several disease outcomes, fluid overload (FO) is defined as the ratio of the sum of the input and output over three consecutive days to the weight of the patient at that time being greater than 5%.

Results

Ninety-eight patients (56 males) were analyzed and their average age is 68 ±16 years old. The average ICU stay is 15 (±12) days and the hospital stay is 33 (±24) days. Forty-two patients expired or were discharged under critical condition. Fifteen patients needed renal replacement therapy during the ICU stay, but only one patient needed further renal replacement therapy after discharge. Based on SCr criteria, forty-seven patients had AKIcr. Sequential organ failure assessment (SOFA) score on ICU admission (Odds Ratio [OR] 1.675; 95% confidence interval [CI], 1.098-2.556; P = 0.017), FO (OR 70.698; 95% CI, 3.034-1647.298; P = 0.008) and hemoglobin (Hb) level on ICU admission (OR 0.463; 95% CI, 0.218-0.987; P = 0.046) are independently associated with AKIcr. According to UO criteria, sixty-eight patients had AKIuo. FO (OR 52.326; 95% CI, 1.163-2354.622; P = 0.042) are independently associated with AKIuo.

Forty-five patients fulfilled both SCr and UO criteria (AKIcruo), and fifty-three patients fulfilled one or none of the two criteria (non-AKIcruo). SOFA score on ICU admission (OR 3.161; 95% CI, 1.110-9.004; P = 0.031) and FO (OR 896.366; 95% CI, 1.134-708635.641; P = 0.046) are independently associated with AKIcruo.

Conclusion

This preliminary study showed that fluid overload is independently associated with AKI based on serum creatinine, urine output, or combination of both criteria. Fluid overload may serve as an important clinical decision tool to stratify patients at risk for AKI. Therefore, in clinical practice, it is crucial to monitor fluid balance in each case. In the event of impending fluid overload, prompt management to reduce potential risks for AKI should be implemented. Further confirmation is warranted in order to validate the association between FO and AKI.

原著論文 113_A67

肝細胞癌患者接受肝切除術後 5 年無復發者的生存結果預測因素

Predictor of survival outcomes in patients with recurrence-free for 5 years after liver resection for hepatocellular carcinoma

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Background
Hepatocellular carcinoma (HCC) is an aggressive tumor. Previous studies reported factors associated with 5-year overall survival (OS) and recurrence-free survival (RFS) for patients underwent liver resection (LR). Few studies reported predictor of long-term survival outcome in patients with recurrence-free for more than 5 years after LR.

Methods
We consecutively enrolled 1133 patients with HCC who underwent LR from 2011 to 2017 at our institution. We excluded patients who developed recurrence or died within 5 years after LR; n=639; and patients who were recurrence-free with a follow-up period of <5 years, n=243. The remaining 251 patients who were recurrence-free and alive for 5 years after LR were enrolled in this study.

Results
60 (23.9%) patients developed recurrence during follow-up period. Among 60 patients, 51 (85%) were recurrence within Milan criteria, 43 (71.7%) underwent curative treatments. There was no significantly different in overall survival (OS) between patients with vs without recurrence (p=0.63). Of the entire cohort, the 10-year OS was 78%; the 10-year recurrence-free survival (RFS) was 68%. Multivariate analysis showed that MELD score, per one increase (HR=1.058; 95%CI=1.005-1.115; p=0.033) and age >65 years (HR=2.997; 95%CI= 1.543-5.820; p=0.001) were associated with mortality; whereas no baseline variable was associated with recurrence.

Conclusion
Recurrence modality beyond 5 years after LR of patients with HCC were mild and majority of them underwent curative treatments. The OS did not differ between those with vs without recurrence. Old age and higher MELD score were associated with mortality and no baseline variables was associated recurrence in this cohort.

原著論文 113_A68

新型發炎生物標記在預測接受射頻燒灼術患者之心房顫動復發的價值

The value of novel inflammatory biomarkers in predicting recurrence of atrial fibrillation in patients receiving radiofrequency ablation

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Background

Atrial fibrillation (AF) is one of the most prevalent cardiac arrhythmias. Radiofrequency ablation (RFA) has demonstrated its efficacy in improving AF recurrence rates, quality of life, and reducing total mortality or cardiovascular hospitalizations. However, AF recurrence remains a significant challenge, particularly in patients with persistent AF (PerAF). This study aims to evaluate the predictive value of comorbidities, echocardiographic parameters, and inflammatory biomarkers in assessing AF recurrence in patients post-RFA.

Methods

We included 98 patients who underwent RFA for AF, comprising 78 (80%) with paroxysmal atrial fibrillation (PAF; AF that terminates spontaneously or with intervention within 7 days of onset) and 20 with PAF (AF that is continuously sustained beyond 7 days). Early recurrence (ER) was defined as any AF event occurring within 90 days post-RFA, while late recurrence (LR) was defined as AF recurrence between 3 and 12 months post-RFA. We assessed the predictive value of comorbidities, echocardiographic parameters, and inflammatory biomarkers for post-ablation AF recurrence.

Results

Sixty-three (64%) patients were men, with a mean age of 61 ± 11 years. Left atrial (LA) size significantly predicted recurrence in the PAF population, but not in PerAF patients. No other baseline characteristics or comorbidities predicted AF recurrence in either PAF or PerAF patients. Inflammatory biomarkers, including MCP-1 and SDF-1a, significantly predicted total recurrence and ER, while IP-10, RANTES, and SDF-1a were associated with LR. SDF-1a was a significant predictor of total recurrence, ER, and LR in the PerAF group.

Conclusion

LA size remains a crucial predictor of post-RFA AF recurrence, particularly in PAF patients. In PerAF patients, SDF-1a has substantial predictive value for post-RFA AF recurrence.

原著論文 113_A69

生長分化因子 15 與細胞外粒線體 DNA 相關

Growth Differentiation Factor 15 is associated with Cell-free Mitochondrial DNA

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Background

Growth differentiation factor-15 (GDF15 is first identified as macrophage inhibitory cytokine-1 (MIC-1) , which has been found to be associated with aging, obesity and cardiovascular disease. Several lines of evidence indicate that mitochondrial stress caused by mitochondrial dysfunction induces expression and secretion of GDF15. Mitochondrial DNA can be released by pro-apoptotic, apoptotic, or necrotic cells, and becoming cell-free mitochondrial DNA (cf-mtDNA). Recent clarification of cytosolic escape of mtDNA triggers innate immunity further underscores the pivotal role of mitochondria in inflammation- related diseases. However, the relationship between GDF15 and cf-mtDNA in regulating metaflammation remain uncertain. Here we investigate the association between GDF-15 and cf-mtDNA.

Methods

73 diabetic subjects, aged over 30 years, were enrolled in the study. Plasm GDF-15 levels were measure using ELISA kit. The level of GDF-15 was logarithmically transformed to improve normality prior to analysis. To analyze cf-mtDNA, urine and plasma will be collected. Isolation of total DNA will be performed with PROBA-NK reagent kit (QIAGEN). The quantitative analysis of mtDNA will be conducted using qPCR method. Statistical analyses were performed by SPSS software with Student's t-test and Pearson's chi-squared and Pearson correlation test. A two‐sided $p < 0.05$ was considered to be statistically significant.

Results

The level of serum GDF-15 is significantly positive correlation with serum and urine cf-mtDNA (r=0.341, p=0.005 and r=0.286, p=0.019, respectively). Chronic kidney disease parameters, creatinine and urine albumin/creatine ratio, are positive correlation with the level of GDF-15 (r=0.351, p=0.004 and r=0.416, p=0.001, respectively) while the level of creatine is positively correlated with serum cf-mtDNA and urine cf-mtDNA (r=0.271, p=0.020 and r=0.240, p=0.042, respectively). Furthermore, age is positively correlated with the level of GDF-15, serum cf-mtDNA and urine cf-mtDNA (r=0.288, p=0.018 and r=0.667, p<0.001 and r=0.564, p<0.001, respectively).

Conclusion

In current study, we suggested that elevation of circulating GDF-15 is associated with cf-mtDNA, which may be related to aging and chronic kidney disease in diabetic patients.

原著論文 113_A70

台灣慢性腎臟病患者之汞暴露：生物監測及暴露風險因子分析

Mercury exposure in patients with chronic kidney disease in Taiwan: Biomonitoring and risk factor evaluation

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Background
The prevalence of chronic kidney disease (CKD) and end-stage renal disease in Taiwan is alarmingly high. Patients with CKD in Taiwan are exposed to several nephrotoxic environmental factors, including toxic heavy metals, and mercury exposure is also commonly identified. Mercury exposure can cause various systemic health issues, including infertility, neurodegenerative diseases, cancer, and kidney disease. Although previous research has addressed the health impacts of mercury exposure in the general population, the biomonitoring profiles and risk factors of mercury exposure have not yet been assessed in patients with CKD in Taiwan.

Methods
This study aimed to explore mercury exposure status among patients with CKD in Taiwan and evaluate the risk factors of mercury exposure in this population. We enrolled adult patients with nondiabetic non-dialysis-dependent CKD stage 3–5 in the Kaohsiung Chang Gung Memorial Hospital to measure their blood and hair mercury concentrations. Patient characteristics and lifestyle factors were collected from the medical records of the hospital and using a lifestyle questionnaire. The mercury concentrations in blood and hair samples were measured using inductively coupled plasma mass spectrometry and compared with the biomonitoring profiles of previous reports in different regions. To analyze risk factors of mercury exposure, the study population was categorized into high and low exposure subgroups according to the upper tertile of hair mercury concentrations. Continuous and categorical variables were compared between the subgroups using the Mann-Whitney U test and Chi-square test, respectively, and logistic regression analysis was conducted to identify independent predictors of high mercury exposure, adjusting for age, sex, body mass index, hypertension, CKD stage, proteinuria severity, and covariates with a p value of <0.1 in univariate analyses.

Results
We enrolled 149 participants in this study, and our results demonstrated that both blood and hair mercury concentrations in the study population were markedly higher compared with the previous reports in different regions (median (interquartile range), blood mercury, 6.60 (3.85–9.90) μg/L; hair mercury, 1.43 (0.86–2.25) μg/g). Additionally, our analyses indicated that age (odds ratio (OR) (95% confidence interval, CI), 1.055 (1.010–1.101) per year, $p = 0.016$] and frequent larger fish consumption (OR (95% CI), 5.915 (1.055–33.174), $p = 0.043$] were independent predictors of high mercury exposure in patients with CKD in Taiwan.

Conclusion

Our findings suggest that patients with CKD in Taiwan have an increased risk of mercury exposure, especially in the elder population and those who consume large fish frequently. This study underscores the importance of public health initiatives aimed at monitoring mercury exposure and promoting lifestyle adjustments among vulnerable populations such as patients with CKD to enhance overall health outcomes.

原著論文 113_A71

FibroScan 控制衰減參數對肝癌患者肝臟脂肪變性的診斷價值及臨床意義

Diagnostic value and clinical significance of FibroScan controlled attenuation parameter for liver steatosis in patients with hepatocellular carcinoma

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Background
Previous studies have demonstrated a correlation between FibroScan Controlled Attenuation Parameter (CAP) and histological assessments of steatosis. However, data specifically related to patients with hepatocellular carcinoma (HCC) are limited. This study aims to investigate the relationship between CAP values and histological evaluations of steatosis and the clinical impact of hepatic steatosis on survival outcomes in HCC patients following curative resection.

Methods
A total of 522 HCC patients who underwent curative hepatectomy from June 2014 to September 2023 were enrolled. All patients were examined by FibroScan to determine CAP within 3 months before surgery. Hepatic steatosis (HS) was classified histologically into three categories: S0 (<5%), S1 (5-30%), and S2 (>30%). We compared the diagnostic performance for HS ≧5% and HS >30% using the area under the curve (AUC) from receiver operating characteristic (ROC) analysis. We further examined the association between hepatic steatosis and clinical outcomes, with overall survival (OS) and recurrence-free survival (RFS).

Results
According to histological assessment, steatosis grade distribution was as follow: S0 = 315 (60.3%), S1 = 189 (36.2%), and S2 = 18 (3.4%), respectively. There was a significant difference between each group of different degrees of HS for the CAP (p<0.001). The ROC curve analysis for FibroScan CAP demonstrated an area under the curve (AUC) of 0.722 (95% confidence interval (CI): 0.679–0.766) for the detection of HS ≧5% on pathology. In contrast, the AUC for detecting HS >30% was significantly higher at 0.912 (95% CI: 0.871–0.953). The diagnostic performance of FibroScan CAP for detecting hepatic steatosis (HS) ≧5% with a cutoff value of >225 was evaluated, yielding a sensitivity of 0.78, specificity of 0.57, and an overall accuracy of 0.65. In contrast, for detecting HS >30% with a cutoff value of >280, the CAP demonstrated a sensitivity of 0.89, specificity of 0.84, and an overall accuracy of 0.84. These findings highlight the strong effectiveness of CAP in identifying significant hepatic steatosis. After a median follow-up of 38 months, patients with high CAP level exhibited a higher risk of mortality (HR: 1.007, P = 0.053) but no significant difference in HCC recurrence rates.

Conclusion

This study confirms that the FibroScan CAP is an effective non-invasive modality for the assessment of hepatic steatosis in patients with HCC, demonstrating strong diagnostic performance for significant steatosis. Although the correlation between CAP values and overall survival did not reach statistical significance, it suggests potential clinical relevance.

原著論文 113_A72

GAAD 可預測肝細胞癌術後的復發

GAAD Score as a Prognostic Model for Recurrence of Hepatocellular Carcinoma After Curative Resection

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Background
The high recurrence rate of hepatocellular carcinoma (HCC) remains a significant challenge, even after curative treatment. The novel GAAD algorithm, which combines gender, age, alpha-fetoprotein (AFP), and protein induced by vitamin K absence or antagonist II (PIVKA- II), was developed as a diagnostic model for HCC. However, the utility of the GAAD score for predicting HCC recurrence is still unknown. The aim of this study is to assess the role of the GAAD score in predicting outcomes for HCC patients after curative resection.

Methods
This study included 294 HCC patients who underwent curative resection at Kaohsiung Chang Gung Memorial Hospital from January 1, 2010, to December 31, 2022. Serum AFP, PIVKA-II levels and GAAD scores (range 0-10) were measured using Elecsys® assays on the cobas® e 601 analyzer. The Kaplan-Meier (KM) curve and log-rank test were used to compare prognosis between the two groups classified by GAAD score. Additionally, the association between the GAAD score and microvascular invasion (MVI) was analyzed.

Results
The optimal cutoff value of the GAAD score for predicting HCC recurrence was 2 from the ROC analysis. By Kaplan-Meier analysis, a GAAD score ≧2 was associated with significantly shorter recurrence-free survival (p=0.006) and overall survival (p=0.045). The multivariate Cox proportional hazards model revealed that a GAAD score ≧ 2 (HR=1.56, 95% CI=1.02- 2.39; p=0.004), the presence of MVI (HR=1.89, 95% CI=1.31-2.71; p=0.001), and satellite nodules (HR=1.38, 95% CI=1.30-4.39; p=0.005) were independent risk factors for HCC recurrence. Furthermore, we found that a GAAD score ≧2 showed a strong positive correlation with MVI (p<0.001).

Conclusion
The pre-operative GAAD score can be used as a predictor for recurrence in HCC patients after curative resection. GAAD score also showed a strong positive correlation with MVI.

原著論文 113_A73

內視鏡橡皮圈結紮法和食道燒灼術治療難治型胃食道逆流症候群的臨床效果比較

Comparison of Clinical Efficacy of Endoscopic Band Ligations and Anti-Reflux Ablation Therapy for Refractory GERD

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Background

GERD is a common gastrointestinal disorder, with about one-third of patients experiencing suboptimal responses to standard treatment with PPIs. Due to the invasiveness and potential complications of antireflux surgery, minimally invasive endoscopic therapies have gained popularity.

The study aims to evaluate the safety and effectiveness of two endoscopic procedures: 1) banding using the Cook® 6 Shooter™ Saeed Multi-Band Ligator (EBL), and 2) antireflux ablation therapy (ARAT).

Methods

The study was prospectively, enrolling 10 patients with refractory GERD symptoms (defined as less than 50% improvement in symptom relief or GERDQLQ score≧20 after 8 weeks of PPI treatment). All of them underwent esophageal manometry and 24 h pH monitoring with diagnosed as acid reflux disease or acid reflux hypersensitivity. Patients were randomly divided into two groups: the EBL group and the ARAT group, with 5 patients in each. In the EBL group, rubber bands were applied to three quadrants at the gastroesophageal junction (GEJ). The ARAT group underwent a hybrid-APC with 270-degree ablation of the EGJ, a technique aimed at generating scar remodeling to reduce reflux. Both groups followed by similar post-procedure care such as taking dexilantprazole for 8 weeks. The study assessed various metrics, including GERDQ, GERDQLQ, RSI, the psychosomatic assessment (BAI and BDI). These were evaluated at baseline, post-treatment at 12 and 24 weeks. Additionally, upper GI endoscopy was performed at 12 weeks to evaluate the Z line, and GEJ width.

Results

The ARAT group was significantly younger than the EBL group (37.0 ± 12.2 vs. 54.8 ± 11.4, $p = 0.044$). Besides, the ARAT group had a higher prevalence of coffee and tea consumption ($p = 0.197$ and $p = 0.038$, respectively). No significant differences in the prevalence of comorbidities were observed. The post-procedure herniation size was significantly reduced in the ARAT group compared to the EBL group (1.4 ± 0.4 vs. 2.0 ± 0.0, $p = 0.046$). However, the change in herniation size (Δ herniation size) did not differ significantly between the groups (0.0 ± 0.6 vs. -0.3 ± 0.3, $p = 0.268$). Both groups showed improvement in GERDQ, GERDQLQ, RSI, BAI, BDI, and SSS-8 scores at 12 and 24 weeks, with no significant differences between the groups. Notably, the reduction in RSI and SSS-8 scores approached statistical significance ($p = 0.095$ and $p = 0.053$, respectively) at 12 weeks, suggesting a trend towards greater symptom improvement in the EBL group, although this did not reach conventional levels of statistical significance. The reduction in SSS-8 scores in the

EBL group was significantly greater than in the ARAT group at 24 weeks (-4.8 ± 4.4 vs. -14.2 ± 4.8, p = 0.012), reaching conventional levels of statistical significance.

Conclusion

While both treatments resulted in improvements in GERD symptoms, quality of life, anxiety, depression, and somatic symptoms, there were no significant differences between the two groups in these outcomes. These findings highlight the potential of both EBL and ARAT as viable alternatives to traditional surgical approaches for refractory GERD, with each having unique advantages.

原著論文 113_A74

比較癌自癒加癌思停聯合或是不聯合質子放射治療在不可切除肝癌病人療效

Comparing Atezolizumab plus Bevacizumab with or without Proton beam radiotherapy in Patients with Unresectable HCC

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Background
Hepatocellular carcinoma (HCC) is a leading cause of cancer-related deaths, particularly among patients with unresectable disease. The combination of Atezolizumab and Bevacizumab (Ate/Bev) has emerged as a promising first-line treatment, yet its efficacy when combined with Proton Beam Therapy (PBT) remains inadequately explored.

Methods
This retrospective study evaluated 184 patients with unresectable HCC treated with Ate/Bev from November 2020 to June 2023 across two centers. Patients with first-line setting were divided into two groups: 44 receiving Ate/Bev with PBT and 140 receiving Ate/Bev alone. Propensity score matching with a 1:2 ratio was utilized to ensure balanced comparisons based on baseline characteristics.

Results
The combination of Ate/Bev with PBT achieved an objective response rate (ORR) of 50.0%, significantly higher than the 27.3% observed in the Ate/Bev alone group ($p<0.001$). The median overall survival (OS) was markedly improved in the Ate/Bev plus PBT group at 16.7 months compared to just 7.1 months for the Ate/Bev group ($p=0.02$). Additionally, the disease control rate (DCR) was 75.7% in the combination group versus 44.2% in the Ate/Bev group ($p<0.001$). The hazard ratio for death was reduced to 0.58, indicating a substantial survival benefit for patients receiving the combination. Treatment-related adverse events TRAEs were comparable between two groups and manageable, primarily involving fatigue and liver inflammation.

Conclusion
The combination of Ate/Bev with PBT significantly enhances survival and response rates in unresectable HCC, positioning this approach as a potential new standard of care. Further prospective studies are essential to confirm these compelling findings.

原著論文 113_A75

建立 B 型肝炎 e 抗原陰性無肝硬化患者在貝樂克或惠立妥停藥後發生臨床復發及 B 型肝炎表面抗原消失的預測模式

Establish the prediction model of clinical relapse and HBsAg loss in HBeAg-negative patients without cirrhosis who discontinued entecavir or tenofovir therapy

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Background
HBV relapse are common after cessation of nuclot(s)ide analoges (NA) therapy. However, HBsAg loss rate was higher in patients who discontinued NA therapy compared to patients who continued NA therapy. The aim of this study is to establish the useful prediction model predict clinical relapse and HBsAg loss after NA cessation

Methods
A total of 709 HBeAg-negative patients without cirrhosis who received entecavir (n=437) or tenofovir disoproxil fumarate (TDF) (n=272) therapy previously and had post-treatment follow-up for at least 12 months were included in this study.

Results
In the entire cohort, the cumulative incidences of virological relapse, clinical relapse and HBsAg loss were 76%, 65.8% and 34.1%. All enrolled patients were randomly assigned to the models of development or validation group in a 2:1 ratio to construct prediction model of clinical relapse and HBsAg loss. Cox regression analysis identified age, HBV genotypes, TDF used, NA-naïve status and HBsAg levels at end of treatment (EOT) were independent risk factors of clinical relapse, and age, HBV genotype, consolidation time and HBsAg level at EOT were independent risk factors of HBsAg loss in the development group. We developed the prediction model of clinical relapse, based on age, HBV genotypes, NA-naïve status, TDF used and HBsAg levels at EOT, with the total scores ranging of 0 to 10. This risk model accurately classified patients into low (0–2), medium (2–6), and high (>6) risks in the development and validation groups ($p < 0.001$). The areas under the receiver operating characteristic curve (AUROC) of 3-, 5- and 10-year risks of HCC were 0.751, 0.722 and 0.701, respectively in the development cohort. We developed the prediction model of HBAs loss based on age, HBV genotypes, consolidation time, and HBsAg levels at EOT, with the total scores ranging of 0 to 12. This risk model accurately classified patients into low (0–2), medium (2–10), and high (>10) risks in the development and validation groups ($p < 0.001$). The areas under the receiver operating characteristic curve (AUROC) of 3-, 5- and 10-year risks of HBsAg loss were 0.937, 0.914 and 0.713, respectively in the development cohort.

Conclusion
Establish prediction model exhibited good discriminant function in predicting clinical relapse and HBsAg loss in HBeAg-negative patients without cirrhosis after cessation of entecavir or TDF therapy. External validation is needed for further verification.

原著論文 113_A76

慢性 B 型肝炎合併肝硬化患者接受核甘酸類似物治療的肝細胞癌風險的機器學習預測模組

A Machine Learning Module for Predicting Hepatocellular Carcinoma Occurrence in Patients with Chronic Hepatitis B and Cirrhosis

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Background

Patients with chronic hepatitis B (CHB) and cirrhosis have a high risk of developing hepatocellular carcinoma (HCC). However, there are few predictive models specifically designed to evaluate this risk in these patients. This study aims to develop a predictive model to assess the risk of HCC in CHB patients with cirrhosis undergoing antiviral therapy.

Methods

The cohort study included 1,592 patients with CHB and cirrhosis from two hospitals in Taiwan. These patients were undergoing treatment with nucleos(t)ide analogues (NA) such as entecavir, tenofovir disoproxil fumarate, or tenofovir alafenamide for at least one year. Patients diagnosed with hepatocellular carcinoma (HCC) within the first 12 months of NA therapy were excluded from the study. The remaining patients were randomly assigned to either a derivation group or a validation group in a 2:1 ratio. A machine learning method, eXtreme Gradient Boosting (XGBoost), was used to develop the predictive model. We calculated the area under the receiver operating characteristic curve (AUROC) and compared it with previous predictive models.

Results

The patients' demographics and baseline characteristics in the derivation and validation groups did not show significant differences. The cumulative incidences of HCC at 5, 8, and 10 years were 15.2%, 22.7%, and 25.7%, respectively. Our model incorporated six parameters: baseline serum albumin concentration and platelet count, as well as age, platelet count, and serum AST and AFP concentrations at 12 months after initiating NA therapy. The AUROC of our model at 3, 5, 8, and 10 years in the validation group were 0.79, 0.77, 0.79, and 0.80, respectively. This demonstrated superior predictive performance for HCC development, surpassing previous models such as APA-B, PLAN-B, PLAN-B retrain, PAGE-B, mPAGE-B, REACH-B, and CU-HCC (AUROC ranging from 0.61 to 0.73; all $p < 0.05$). Patients were stratified into three distinct risk categories based on the risk scores computed by our model. In the validation cohort, the 10-year cumulative risks of HCC development were 9% for the low-risk group (0-0.15), 26% for the moderate-risk group (0.15-0.30), and 67% for the high-risk group (0.30-1).

Conclusion

The proposed machine learning model for predicting HCC development exhibited excellent predictive accuracy in CHB patients with cirrhosis undergoing NA therapy.

原著論文 113_A77

實習醫學生轉站筆試中風濕科與其他內科次專科得分之比較

Medical students' scoring in rheumatology and other specialties of internal medicine: a comparative study

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Background
Among the various specialties within internal medicine, rheumatology is often considered more challenging for medical students. This study explored this perception by analyzing the scores of final-year medical students on their end-of-rotation written exams, specifically focusing on rheumatology compared to other internal medicine specialties.

Methods
This cross-sectional study was conducted at a tertiary teaching hospital from June to December 2023. Final-year medical students took a written exam following their internal medicine rotation. The exam included 40 multiple-choice questions covering all internal medicine specialties. The questions were sourced from previous board exams and then revised to ensure similar difficulty, by fellows of each specialty and two chief residents responsible for teaching. Scores (percentage of correct answers) were reported as median (interquartile range, IQR). The Mann-Whitney test was used to compare scores of rheumatology with those of other specialties. Logistic regression was employed to identify factors associated with students who achieved a rheumatology score higher than the average for other specialties.

Results
Seventy-seven students participated in the study. Of these, 38 (49%) had completed a rotation in rheumatology during their clinical years. The median score of rheumatology was 80 (IQR 25), compared to 79.3(IQR 20.2) of the average of other seven specialties ($p = 0.01$). After adjusting for rotation in rheumatology, neither gender nor the students' total score were associated with a rheumatology score higher than the average of other specialties.

Conclusion
The score of final-year medical students in rheumatology, despite different total scores, was comparable to the average of other specialties. Future studies may explore either students in different learning environment, or subsequent process of post-graduate training.

原著論文 113_A78

102 例頑固貧血之維持性透析患者的骨髓研究、臨床特徵和存活分析

Bone marrow study, clinical characteristics and overall survival in 102 patients with refractory anemia on maintenance dialysis

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Background
Bone marrow status is rarely investigated in chronic dialysis patients with refractory anemia.

Methods
Between 2015 and 2023, we retrospective reviewed and analyzed of bone marrow and clinical characteristics in 102 chronic dialysis patients with refractory anemia at National Taiwan University Hospital.

Results
A total of 58 (56.9%) men and 44 (43.1%) women, median age was 63 years (range 20 - 94). 49 (48%) patients were 65 years or over. 75 (73.5%) patients received hemodialysis and 27 (26.5%) patients received peritoneal dialysis. Bone marrow studies revealed, 71(69.6%) patients had hypocellular marrow, 14(13.7%) had normocellular marrow, 12 (11.8%) had myelodysplastic syndrome, 2(2.0%) had hypercellular marrow, 2(2.0%) had erythroid hyperplasia, and 1(1.0%) had erythroid hypoplasia. 60(58.8%) patients fit the criteria of moderate aplastic anemia. All patients had ever received blood transfusion, 32 patients had received danazol therapy, 17 of 32(53.1%) had response to danazol (5 complete response, 12 partial response, 15 no response).
The median follow up time after initial bone marrow study is 33.4 months (ranges from 0.3 to 192.4 months). A total of 33 (32.4%) patients died during the follow up period, including 17 patients died of infection, 9 cardiovascular events, 6 massive gastrointestinal bleeding, and one lung cancer with brain metastasis progression. Multivariate analysis revealed stroke, chronic obstructive pulmonary disease, congestive heart failure, transfusion dependent, and leukopenia < 4.0 x 10^6/l are independent prognostic factors of overall survival in dialysis patients with refractory anemia.

Conclusion
Bone marrow status is an essential tool to evaluate in dialysis patients with refractory anemia. Hypocellular marrow is the most common findings, and 58.8% patients fit the criteria of moderate aplastic anemia, but the pathophysiology needs to further investigation.

原著論文 113_A79

2021CKD-EPI 公式與其他腎絲球過濾速率估算公式在心導管患者中的比較研究

Comparison of the 2021 Chronic Kidney Disease Epidemiology Collaboration Equation with Prior Estimated Glomerular Filtration Rate Equations in Patients Undergoing Cardiac Catheterization

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Background

Ultra-low-contrast(ULC) coronary angiography is recommended to reduce the risk of contrast-induced nephropathy(CIN), particularly in patients with chronic kidney disease(CKD). The ULC strategy restricts the maximum contrast volume to the glomerular filtration rate(GFR), the reliable estimation(eGFR) of which, is essential to regulate the contrast volume before cardiac catheterization(CC). In 2021, a new CKD epidemiology(CKD-EPI) collaboration equation was introduced, which has since been widely adopted as a standard for eGFR. This study aimed to compare these new equations with the commonly used eGFR equation in patients undergoing CC.

Methods

Fifty-six participants were selected from the database of prospective pressure wire studies. The creatinine and cystatin C levels were measured in serum samples collected during cardiac catheterization. Participants with incident hemodialysis for end-stage kidney disease and residual kidney function with a daily urine volume of >500 mL were also enrolled. GFR was estimated using the creatinine-based equation (2021 CKD-EPI$_{creatinine}$, 2009 CKD-EPI$_{creatinine}$, and modification of diet in renal disease [MDRD]) and the combined creatinine and cystatin C-based equation (2021 CKD-EPI$_{creatinine\text{-}cystatin}$). We used the 2021 CKD-EPI$_{creatinine}$ as the reference and assessed the discrepancies between P10 and P30 (the proportion of individuals whose eGFR values from other equations differed by more than 10% and 30% from the reference values). Subgroup analyses categorized patients into non-CKD and CKD groups based on 2021 CKD-EPI$_{creatinine}$≧60 or <60 mL/min/1.73 m^2. Pairwise comparisons were performed using Wilcoxon signed-rank tests.

Results

The mean age of the participants was 69 years (21% of female and 39% of participants with CKD). The 2021 CKD-EPI$_{creatinine}$ equation showed a significantly higher median eGFR compared to the 2009 CKD-EPI$_{creatinine}$ and MDRD (72.7 [40.0,86.1] vs 67.1 [37.1,80.1], 66.0 [37.6,77.6] mL/min/1.73 m^2, both $p < 0.05$), with non-significant differences compared to the 2021 CKD-EPI$_{creatinine}$-cystatin (72.7 [40.0,86.1] vs 69.24 mL/min/1.73 m^2, $p>0.05$). These results were consistent in the non-CKD group, however, varied in CKD group. In the CKD group, the median eGFR of the 2021 CKD-EPI$_{creatinine}$ was significantly higher than that in the other groups. (27.9 [12.1,46.7] vs 25.7 [11.1,43.2], 27.0 [11.9,44.1], 25.6 [12.1,42.1] mL/min/1.73 m^2, all $p <0.05$). The 2021 CKD-EPI$_{creatinine}$-cystatin group had the lowest eGFR in the CKD group, with a P10 of 40.9% and a P30 of 4.5%. Both the 2009 CKD-EPI$_{creatinine}$ and MDRD had none of the P10 and P30, except for 9.1% of P10 from the MDRD equation.

Conclusion

The 2021 CKD-EPI$_{creatinine}$ equation estimated a higher GFR than the other equations in both CKD and non-CKD subgroups. Notably, in patients with CKD, 2021 CKD-EPI$_{creatinine}$ eGFR may be overestimated, as evidenced by the largest discrepancies when compared to the 2021 CKD-EPI$_{creatinine\text{-}cystatin}$ equation, which is assumed to be less influenced by muscle mass and nutritional status. Furthermore, the eGFR of the ULC strategy was derived from either the 2009 CKD-EPI$_{creatinine}$ or the MDRD equation; the judicious use of the novel equation in contemporary CC should be considered. Conclusively, in patients with CKD undergoing CC, careful evaluation of the 2021 CKD-EPI$_{creatinine}$ equation is crucial to prevent excessive contrast administration and to lower the risk of CIN.

原著論文 113_A80

應用機器學習模型來預測慢性腎臟病第 3 到第 5 期和末期腎臟病病人的骨密度檢查結果是否為骨質疏鬆症

Machine Learning Models to Predict Osteoporosis in Patients with Chronic Kidney Disease Stage 3–5 and End-Stage Kidney Disease

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Background

Chronic kidney disease-mineral bone disorder (CKD-MBD) is a common complication in patients with CKD and end-stage kidney disease (ESKD), and it significantly increase the risk of osteoporosis and fractures. Studies show that osteoporosis affects 18% to 32% of patients with CKD. However, no study has employed multiple machine-learning (ML) models to predict osteoporosis in this population. Therefore, this study aimed to develop predictive ML models to identify osteoporosis risk in patients with CKD stages 3–5 and ESKD and to propose a one-year predictive model for clinical application.

Methods

We retrospectively analyzed a de-identified osteoporosis database from a Taiwanese hospital, including 6,614 patients with CKD stages 3–5 and ESKD who underwent bone mineral density (BMD) scans between January 2011 and June 2022. Demographic data, comorbidities, laboratory results, and BMD were extracted. We used three feature selection methods to select the features for model development: feature importance, recursive feature elimination, and selected key features from those identified in methods 1 and 2 through group discussion. Nine ML algorithms were applied to predict osteoporosis: logistic regression, XGBoost, LightGBM, CatBoost, SVM, decision tree, random forest, k-nearest neighbors, and an artificial neural network (ANN). To evaluate the performance, we used metrics such as area under the curve (AUC), precision, recall, accuracy, and F1 score.

Results

The ANN model with eight selected features (age, creatinine, height, weight, albumin, glucose, intact parathyroid hormone, and hemoglobin) in the third feature selection method achieved the highest predictive performance, with an AUC of 0.940 on the validation and 0.930 on the test datasets. This model also outperformed the other ML models in terms of accuracy, precision, recall, and F1 scores. The receiver operating characteristic curve, confusion matrix, and predictive probability histogram revealed that the ANN model performed well in terms of discrimination. Calibration and decision curve analyses further demonstrated the reliability and applicability of the ANN model.

Conclusion

We developed an accurate ML-based model to predict osteoporosis in patients with CKD stages 3–5 and ESKD. The ANN model demonstrated the potential for clinical implementation in screening high-risk patients for osteoporosis and optimizing resource allocation for BMD scanning.

原著論文 113_A81

血液透患者透過機器學習方法來預測主要不良心血管事件

Machine Learning Approaches for Major Adverse Cardiovascular Events (MACE) Prediction in Hemodialysis Patients

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Background
Major Adverse Cardiovascular Events (MACE) are common complications of hemodialysis (HD) patients that include myocardial infarction (MI), stroke, cardiac arrhythmia and heart failure (HF). The objective of the current study was to predict MACE among our HD patients.

Methods
HD patients above 18 years old were recruited 29356 HD sessions for the study between 2014 to 2023 from our hospital database of the TSN-KiDiT (kidney, dialysis, and transplantation integrated software), which is integrated operation management system and quality control for Taiwan Society of Nephrology. Different Machine learning algorithms: including RandomForest (RF), XGBoost, logistic regression (LR), and KNN(K Nearest Neighbor) were employed. Clinical attributes, electrolytes, dialysis adequacy and blood flow (BF), cardiothoracic ratio (CT ratio) and biomarkers were explored in predicting MACE. The feature importance was determined using mean decrease accuracy.

Results
Overall, 28788 HD sessions were included in the analyses, there were 3791 events of MACE within 12-month. The XGBoost Model demonstrated a prediction accuracy of 88.92% with the area under the receiver operating characteristic curve (AUROC) 94.42%, which is higher as compared to the RF 84.54% [AUROC 94.95%], the LR model 65.23% [AUROC 65.23%], however, the KNN has the best accuracy 92.45% [AUROC 93.28%] with less sensitivity 59.47%, respectively. The classification accuracy of the models for cardiac arrhythmia was 89.01%, which was higher than prediction accuracy for acute myocarial infarction (AMI: 83.67%), and heart failure (HF: 82.84%). Age, CT ratio, glucose, transferrin saturation, albumin, ferritin, alk-P, MCV and PTH, BF were the major predictors of MACE.

Conclusion
The ML models had shown acceptable performance in predicting MACE in HD patients. Age, CT ratio, glucose and other biomarkers were important predictors of MACE, which is consistent between the individual components of MACE, such as cardiac arrhythmia, MI, and HF. These parameters can be calibrated as prognostic parameters of MACE events in HD patients.

原著論文 113_A82

糖尿病合併心房顫動患者使用 SGLT2 抑制劑降低癌症風險：一項傾向分數匹配研究

Reduction of Cancer Risk in Atrial Fibrillation Patients with Diabetes Mellitus Through SGLT2 Inhibitor Usage: A Propensity-Score Matched Study

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Background
Atrial fibrillation (AF) and diabetes mellitus (DM) are prevalent co-morbidities with a potential linkage to increased cancer risk. Sodium-glucose cotransporter-2 inhibitors (SGLT2i) have been posited to affect this risk.

Objective
To evaluate the impact of SGLT2i on cancer incidence in patients with AF and DM.

Methods
Using the TriNetX health research network, encompassing 81 healthcare organizations, we identified patients with AF and DM between the ages of 55 and 85. Cohort 1 (SGLT2i users) and Cohort 2 (non-SGLT2i users) were established using stringent query criteria, including diagnoses, medications, and patient visits. Propensity score matching was applied to adjust for baseline differences. The analysis focused on cancer outcomes during follow-up from 2016-2023, employing survival analysis and Cox regression.

Results
Out of 16,745 patients on SGLT2i, 119 developed cancer, equating to a 0.71% cumulative incidence. Comparatively, the non-SGLT2i group, with 16,708 patients, had 199 cancer cases, reflecting a 1.19% cumulative incidence. Kaplan-Meier survival analysis indicated a significant survival benefit on incident cancer for the SGLT2i group. Cox regression revealed a hazard ratio (HR) of 0.611 (95% CI: 0.487-0.767), indicating a 39% reduced risk of cancer for those on SGLT2i therapy.

Conclusion
SGLT2i use in AF and DM patients is significantly associated with a lower risk of cancer, underscoring the potential of SGLT2i as a protective agent in this high-risk population. Further

research is needed to confirm these findings and explore the underlying mechanisms.

原著論文 113_A83

急性腎損傷患者之微量營養素攝取與腎臟預後相關

Micronutrient Intake is Associated with Major Adverse Kidney Outcomes in Critically Ill Patients with Acute Kidney Injury

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Background
Acute Kidney Injury (AKI) frequently occurs in ICU patients, often resulting in adverse renal outcomes such as dialysis dependence and increased mortality. In patients with AKI, the balance of trace elements like selenium, zinc, and copper is frequently disturbed. This study aims to explore the association between trace element intake and renal outcomes in critically ill patients with severe sepsis.

Methods
This prospective cross-sectional and follow-up study included ICU patients over 20 years old with severe sepsis, who stayed in the ICU for more than 48 hours, excluding those with end-stage renal disease. Major adverse kidney events within 28 days (MAKE-28) were assessed based on criteria such as dialysis requirement, sustained doubling of serum creatinine from baseline, and/or death by the 28th day after ICU admission. Data were collected on the first day of ICU admission, and the average 7-day intake of nutrients from enteral nutrition and intravenous fluid infusions was recorded and analyzed.

Results
Among 80 critically ill patients, the mean age was 69.5 ± 14.2 years, with 62.5% male, and 66.25% developed AKI upon ICU admission. During the 28-day follow-up, 35% of patients experienced MAKE-28. After adjusting for age, gender, and APACHE II score, significant associations were identified between nutritional intake and MAKE-28. Specifically, for patients admitted with AKI, there were significant correlations between MAKE-28 and various nutritional parameters, including mean intake of energy, carbohydrates, protein, and trace elements (selenium, zinc, and copper). However, for patients without AKI on admission, nutritional intake was not significantly linked to renal outcomes.

Conclusion
The findings suggest that nutritional intake, encompassing both macronutrients and trace elements like selenium, zinc, and copper, is crucial for renal outcomes in critically ill patients, particularly those admitted with AKI.

原著論文 113_A84

頭頸癌患者同時患有早期食道鱗狀上皮癌肌層黏膜侵犯後接受內視鏡黏膜下剝離術的良好長期預後

Favorable Long-Term Outcomes of Endoscopic Submucosal Dissection for Early Esophageal Squamous Neoplasia with Muscularis Mucosa Involvement in Head and Neck Cancer Patients

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Background
Optimal treatment and surveillance strategies after endoscopic submucosal dissection (ESD) for esophageal squamous cell neoplasia (ESCN) with unfavorable histologic features remain uncertain. This study aimed to evaluate the long-term outcomes in high-risk ESCN patients treated with ESD under expanded indications.

Methods
A retrospective analysis was conducted on early ESCN patients who underwent ESD at two medical centers in Taiwan between August 2010 and December 2023. Collected data included demographic, endoscopic, and pathological characteristics. Long-term outcomes, such as overall survival (OS), disease-specific survival (DSS), and recurrence rates, were analyzed.

Results
A total of 146 patients (mean age 59.17 years) with 183 lesions were included, of which 73 (50%) had a history of head and neck cancer (HNC). En bloc and R0 resections were achieved in 100% and 95.6% of lesions, respectively. The 5-year OS, DSS, and local recurrence rates were 42.7%, 94.7%, and 11%, respectively. In univariate analysis, R0 resection was significantly associated with lower recurrence (P=0.05), while tumor size (P=0.41), lesions involving more than three-fourths of the esophageal circumference (P=0.93), cell differentiation (P=0.21), HNC history (P=0.68), and lymphovascular invasion (P=0.15) were not. Alcohol abstinence was independently associated with a reduced risk of recurrence (HR: 0.34, 95% CI: 0.16–0.73, P=0.006). Patients with pT1a-MM (muscularis mucosa invasion) showed similar OS (P=0.82), DSS (P=0.617), and recurrence rates (P=0.63) compared to those with pT1a-EP/LPM (epithelial/lamina propria invasion).

Conclusion
In this study, long-term outcomes following ESD for expanded indications in ESCN patients were favorable. ESD may be a suitable option for selected patients with ESCN involving the muscularis mucosa, especially among high-risk HNC patients.

原著論文 113_A85

以內視鏡切除胃肌肉層腫瘤：一個多中心研究

Endoscopic Resection Beyond Submucosa for Gastric Myogenic Tumor: A Multicenter Study

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Background
The prevalence of gastric subepithelial lesions (SELs) is rising. SELs with malignant potential, such as gastrointestinal stromal tumor (GIST), should be managed. Endoscopic resection (ER) are minimally invasive alternatives for resection of myogenic tumor, which also provides precise histological data. This study aims to evaluate the effectiveness and safety of ER for gastric myogenic tumors.

Methods
The study was conducted between January 2012 and April 2024 at nine tertiary-care referral centers in Taiwan. We enrolled patients with endoscopic ultrasound (EUS)-documented myogenic tumors of stomach. The primary outcomes were technical success and en bloc rates. Secondary outcomes included R0 resection rate, procedure time, complications, rate of shifting to unintentional endoscopic full thickness resection (EFTR), hospital stay, recurrence, and mortality.

Results
Total 325 patients with 332 lesions [153 (46.1%) leiomyoma, 152 (45.8%) GISTs and 27 (8.1%) other histology] were enrolled. The technical success, en-bloc and R0 resection rates were 97.0%, 94.3% and 88.9%, respectively. Mean (range) EUS tumor size and procedure time were 14.5 (3~45) mm and 60.6 (3~315) minutes. Twenty-four (9.0%) procedures were shifted to unintentional EFTR. No recurrence occurred during mean follow-up period of 944.1 days. Twenty-one (6.3%) patients had complications including intra-procedure inadvertent perforation (4.5%), delay perforation (0.3%), delayed bleeding (0.6%) and others (0.9%). Two patients died of non-procedure related reasons. Male gender, elderly age, larger tumor size, heterogeneous echotexture and exophytic growth pattern under EUS were independent risk factors for GIST (all with $p < 0.05$).

Conclusion
ER appears to be an efficient and safe method for the management of gastric myogenic tumors. Additionally, the malignant potential could be predicted by EUS features.

原著論文 113_A86

探討退伍肺炎群聚統計量和傳染病數理模型

An aspect to statistics of Legionella pneumonia cluster and infective mathematical mode

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Background
Human Error in healthy care, cluster pneumonia, cost phenomenal

Methods
medical statistics , field and data collect

Results
Predict probability of cluster and mead time to human error MTTH

Conclusion
Topic indicate threshold of surveillance and inf.mode of math.

原著論文 113_A87

血清氧化三甲胺濃度跟第二型糖尿病病人週邊動脈阻塞性疾病有關

Serum Trimethylamine N-oxide levels are associated with peripheral artery disease in patients with type 2 diabetes mellitus

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Background
Trimethylamine N-oxide (TMAO) is a gut-derived uremic toxin and increases the risk of hypertension, all-cause mortality, and cardiovascular events. Peripheral arterial disease (PAD), defined by low ankle-brachial index (ABI), is associated with increased mortality in type 2 diabetes mellitus (T2DM) patients. The present study aimed to determine the relationship between serum TMAO levels and PAD in T2DM patients.

Methods
The present cross-sectional, single-center study included 120 persons with T2DM. Serum total TMAO levels were determined by high-performance liquid chromatography-mass spectrometry. ABI values were measured using an automated oscillometric device. Patients with ABIs of <0.9 were categorized into the low ABI group.

Results
Among the 120 T2DM participants, 23 T2DM patients (19.2%) had low ABIs. Older age ($p = 0.017$), as well as the urine albumin-to-creatinine ratio (UACR) ($p < 0.001$) and higher serum levels of C-reactive protein (CRP) ($p < 0.001$), TMAO ($p < 0.001$), were higher in the low ABI group compared with the normal ABI group. The multivariable logistic regression analysis revealed that serum levels of TMAO (odds ratio [OR]: 1.098, 95% confidence interval [CI]: 1.038–1.161, $p = 0.001$) were independently associated with PAD in T2DM patients after adjusted associated cofounders. Log-transformed left ABI (log-left ABI, $p =0.017$) and log-right ABI ($p =0.001$) were negatively correlated with log-TMAO and left log-ABI, log-right ABI was negatively correlated with log-UACR, and log-CRP (all $p < 0.001$, respectively) by using the Spearman correlation analysis. Log-TMAO level was negatively correlated with estimated glomerular filtration rate (eGFR, $p = 0.009$), log-UACR, and log-CRP (all $p < 0.001$, respectively) by using the Spearman correlation analysis. The area under the receiver-operating characteristic (ROC) curve predicting PAD by serum TMAO level in T2DM patients was 0.812 (95% CI: 0.701–0.923, $p < 0.001$).

Conclusion
In this study, serum TMAO levels were negatively correlated with left and right ABI values and were associated with PAD in T2DM patients.

原著論文 113_A88

血清骨鈣素升高是冠狀動脈疾病患者內皮功能失調的危險因子

Increased serum osteocalcin is a risk factor for endothelial dysfunction in patients with coronary artery disease

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Background

Osteocalcin (OC) is the most abundant non-collagenous protein in bone matrix, which is considered a marker of bone formation. The OC activity depends on vitamin K and is associated with vascular calcification. Impaired endothelial function has an intimate link with coronary artery disease (CAD) and is associated with significant morbidity and mortality. To better understand the connection between endothelial dysfunction in patients with CAD, serum OC levels were examined in this study.

Methods

Patients with CAD, defined by >50% stenosis in any segment by coronary angiography. There are 125 patients with CAD included. A commercial enzyme-linked immunosorbent test kit was applied to determine the levels of OC. The vascular reactivity index (VRI), assessed by the digital thermal monitoring test, provides information on endothelial function. A VRI of less than 1.0 indicated poor vascular reactivity; a VRI of 1.0–2.0 indicated intermediate vascular reactivity; and a VRI of 2.0 or higher indicated good vascular reactivity.

Results

Thirteen patients with CAD (10.4%) were classified as having poor vascular reactivity (VRI < 1.0), 59 CAD patients (47.2%) as having intermediate vascular reactivity (1.0 VRI < 2.0), and 53 CAD patients (VRI <2.0) were classified as having high vascular reactivity. A greater serum OC level ($p < 0.001$), total cholesterol (TCH, $p < 0.001$), low-density lipoprotein cholesterol (LDL-C, $p = 0.004$), and older age ($p = 0.019$) were linked to impaired vascular reactivity. Advanced age ($r = -0.218$, $p = 0.015$), serum TCH ($r = -0.327$, $p < 0.001$), LDL-C ($r = -0.287$, $p = 0.001$), and OC level ($r = -0.507$, $p < 0.001$) were negatively correlated with VRI. Multivariable forward stepwise linear regression analysis revealed that the serum level of OC ($\beta = -0.449$, adjusted R2 change = 0.251; $p < 0.001$), TCH ($\beta = -0.218$, adjusted R^2 change = 0.033; $p = 0.010$), and advanced age ($\beta = -0.214$, adjusted R^2 change = 0.040; $p = 0.004$) were significantly and independently associated with VRI in patients with CAD.

Conclusion

In patients with CAD, serum OC levels were adversely correlated with VRI and probably had a role in endothelial dysfunction.

原著論文 113_A89

血清硫酸吲哚酚濃度為非透析第三期到第五期慢性腎臟病患者週邊動脈硬度潛在的生物標記

Serum indoxyl sulfate as a potential biomarker of peripheral arterial stiffness in patients with non-dialysis chronic kidney disease stage 3 to 5

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Background

Indoxyl sulfate (IS)-induced oxidative stress is detrimental to vascular structures through the altered functions of endothelial and smooth muscle cells and is associated with arterial stiffness. Peripheral arterial stiffness (PAS) predicts future cardiovascular disease. The brachial-ankle pulse wave velocity (baPWV) is a simple marker to assess PAS and is useful for predicting future cardiovascular events. The study aimed to investigate the correlation between serum IS level and PAS measured by baPWV values in patients with CKD stage 3 to 5.

Methods

Fasting blood samples and baseline characteristics were obtained from 146 CKD stage 3 to 5 patients. An automatic pulse wave analyzer (VaSera VS-1000) was determined as PAS to measure baPWV values and either side of baPWV value greater than 18.0 m/s. Serum total IS levels were determined by high-performance liquid chromatography-mass spectrometry.

Results

Among 146 CKD patients, 62 (42.5%) were in the PAS group. When compared to those in the control group, the PAS group had a high prevalence of diabetes mellitus (DM, $p = 0.029$), hypertension ($p = 0.003$), older age ($p < 0.001$), higher systolic blood pressure (SBP, $p < 0.001$), diastolic blood pressure (DBP, $p = 0.013$), urine protein–creatinine ratio (UPCR, $p = 0.016$), serum creatinine ($p = 0.044$), IS level ($p = 0.001$), while lower in serum albumin ($p = 0.013$), and estimated glomerular filtration rate (eGFR, $p = 0.003$). Multivariate logistic regression analysis of the factors significantly associated with PAS revealed that serum IS levels (odds ratio (OR): 1.298, 95% confidence interval (CI): 1.024–1.646, $p = 0.031$), age (OR: 1.108, 95% CI: 1.054–1.165, $p < 0.001$), DM (OR: 2.724, 95% CI: 1.152–6.442, $p = 0.022$), and DBP (OR: 1.067, 95% CI: 1.005–1.133, $p = 0.034$) were the independent predictors of PAS in CKD patients. By Spearman correlation analysis, logarithmically transformed IS (log-IS) levels were significantly positively correlated with baPWV ($p = 0.009$), right baPWV ($p = 0.015$), SBP ($p < 0.001$), and log-UPCR levels ($p < 0.001$) and negatively correlated with eGFR ($p < 0.001$). The area under the receiver-operating characteristic curve for serum IS was 0.667 (95% CI: 0.580–0.754, $p = 0.0002$) to predict the development of PAS in patients with CKD stage 3 to 5.

Conclusion

These findings demonstrate that serum IS level is a significant risk factor for developing PAS in non-dialysis stage 3-5 CKD patients.

原著論文 113_A90

區域醫院門診氣喘病人緩解因素分析

Factors Associated with Clinical Remission of Asthma in a Community Hospital

惠群 1 詹明澄 2

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Background
The goal of asthma management has shifted from merely controlling symptoms to achieving sustained disease remission or even halting disease progression. This study aimed to assess the clinical characteristics associated with achieving or not achieving clinical remission.

Methods
This retrospective 3-year cohort study included patients who received asthma management at the outpatient clinic in the chest department. National Health Insurance claim data and records from the "Pay for Performance Program for Asthma" (P4P) were collected to evaluate the program's effectiveness in improving asthma control. Clinical remission of asthma was defined by meeting all three criteria: an ACT score of 24 or more, FEV1 greater than 80% of the predicted value, and no history of exacerbation during at least six months of follow-up.

Results
Between January 2021 and December 2023, 285 patients were screened, and 143 were included in the analysis. The mean age was 57.6 ± 16.3 years, with 62.2% being female, 14.0% current smokers, and 17.5% presenting with an ACT score below 20 at baseline. After a minimum of six months of follow-up, 56.6% of patients had not achieved the defined clinical remission. The non-clinical remission group was associated with smoking (adjusted odds ratio [AOR] 4.944, 95% confidence interval [CI] 1.241 to 19.687, P = 0.023), an ACT score of 24 or less (AOR 4.669, 95% CI 1.670 to 13.053, P = 0.003), reduced FEV1 of less than 80% (AOR 17.892, 95% CI 6.881 to 46.527, P < 0.001), and exacerbations in the three months prior to enrollment in the P4P program (AOR 3.441, 95% CI 1.102 to 10.744, P = 0.033). Differences in age, BMI, sex, comorbidities, blood neutrophil, and eosinophil count between the two groups were not statistically significant at baseline.

Conclusion
Our real-world asthma cohort study identified key risk factors for failing to achieve clinical remission. Despite constraints like a small sample size and limited follow-up tests, the study provides practical insights for community hospitals. Future research should focus on comprehensive biomarker tracking to refine remission criteria and guide treatment strategies effectively.

原著論文 113_A91

使用奎寧對於高風險類風濕性關節炎患者進展到類風濕性關節炎有預防作用

Preventive effect of hydroxychloroquine on the progression of pre-RA patients to rheumatoid arthritis

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Background
Rheumatoid arthritis (RA), one of the most common autoimmune rheumatic disease. Hydroxychloroquine (HCQ) can improve some outcome measures of disease activity when used monotherapy or combined with other DMARDs in patients with established RA. However, its preventive treatment on Pre-RA phase, to delay future development for RA is limited.

Methods
This retrospective cohort study utilized data from the US Collaboratory network, a sub-network of the TriNetX database. The study population consisted of adult patients ≧ 18 years old without RA but with at risk RA phase, divided into two cohorts, one for HCQ user after high-risk RA compared with non-HCQ user. The primary outcome was defined as diagnosed of RA (ICD-10 CM; M05-M06).

Results
A total of 136778 high-risk RA patients were selected to participate and finally 2210 patients were enrolled in each group after propensity score matching. Baseline covariates including gender, race, comorbidities or relative laboratory parameter did not differ between the two group after matching. Incidence outcome after 5 years found that 278 patients developed RA in HCQ user whereas 420 patients developed RA in non HCQ user group (hazards ratio 0.581, 95% CI 0.5–0.68). There was no different risk of all arrhythmia in patients using HCQ than without HCQ (adjusted hazards ratio 0.81, 95% CI 0.61–1.07).

Conclusion
Individuals who were high-risk RA, the administration of HCQ may prevent the progression of pre-RA to RA. Larger prospective or randomised control trial is necessary to verify the prevent outcomes of this study.

原著論文 113_A92

單細胞及空間轉錄體分析發現血液-腸道-腎臟組織間的代謝與炎症相互作用：解析小鼠經餵食擬桿菌後改善微量白蛋白尿的機轉

Single-cell and spatial transcriptome analyses reveal metabolic and inflammatory crosstalk of blood-gut-kidney tissues linked to improvement of microalbuminuria after gut colonization of Bacteroid spp in mouse models

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Background
Gut dysbiosis is present in chronic kidney disease (CKD) patients. Gut microbiota manipulation represents a novel and promising therapeutic approach to tackle the gut-kidney interaction. However, the candidate live bioproducts and the pathophysiology linked to its renoprotective effects remain obscure in CKD.

Methods
Feces of 228 (16S rRNA sequencing, discovery cohort) and 93 (shotgun metagenomic sequencing, validation cohort) CKD patients were collected to evaluate candidate compounds of live biotherapeutic products for CKD treatments. Bacteroids spp were retrieved as the most discriminatory taxa associated with CKD. Clinical isolates of Bacteroid spp were retrieved from 10 health volunteers. High-fat diet (HFD,mimicking mild CKD) and adenine (mimicking moderate CKD) models were used to elucidate the causal relationship of such bacterial candidates. Microbiome, metabolome as well as single-cell and spatial transcriptome analyses were conducted to elucidate the pathophysiology of gut-kidney interaction after Bacteroids spp feeding.

Results
P We showed that colonization of Bacteroid spp in both HFD and adenine-induced mouse models of CKD by oral gavage ameliorated the morphological (podocyte foot process effacement) and functional changes (microalbuminuria levels) in the kidney. Metabolically, improvements of levels of glucose, cholesterol, TNF-α, IL-1α, IL-1β were seen. Single-cell and spatial transcriptomic sequencing analyses revealed involvements of altered immune responses in the mouse kidney. Specifically, the elevation in the expression levels of genes associated with renal inflammation by systematic metabolic abnormalities was reversed by gut colonization of Bacteroid spp. Moreover, gene expression profiles of colon tissues from Bacteroid spp-treated CKD mice showed that genes related to endotoxic shock responses were differentially expressed, highlighting potential organ crosstalk with coordinated metabolic and inflammatory responses after Bacteroid spp treatment.

Conclusion
These experimental findings implicate Bacteroid spp as a promising live biotherapeutic product for CKD, providing potential avenues for microbiome-based modality of renal insufficiency.

原著論文 113_A93

大學生的阻塞性睡眠呼吸中止的調查

Obstructive sleep apnea survey at the college students

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Background

Obstructive sleep apnea (OSA) is characterized by intermittent pauses in airflow caused by the collapse of the upper airway during sleep. In-laboratory polysomnography (PSG) is the gold standard for diagnosing OSA. However, PSG is time-intensive and not easily accessible. Previous studies suggest that the prevalence of OSA may be underestimated. This study aimed to investigate the potential prevalence of OSA among college students.

Methods

This cross-sectional study evaluated participants aged 20 years or older who attended a sleep lecture at the Department of Social Work in Central Taiwan on June 5, 2024. Participants completed the STOP-Bang questionnaire, which gathered information about sex, age, height, weight, snoring, tiredness, observed apnea, high blood pressure, and neck circumference. Based on their STOP-Bang scores, participants were categorized as low, intermediate, or high risk for OSA. A total score of 2 or less indicated a low risk, while scores of 3 or 4 indicated an intermediate risk. A score greater than 5 indicated a high risk for OSA.

Results

A total of 99 participants completed the sleep survey, consisting of 14 males and 85 females. The participants had an average age of 23.4 ± 6.9 years and an average body mass index (BMI) of 23.6 ± 4.7 kg/m^2. Among them, 17 participants (17.2%) reported experiencing loud snoring, 74 participants (74.1%) reported daily tiredness, 4 participants (4.0%) had a history of observed apnea, and 7 participants (7.1%) reported high blood pressure. Overall, 86 participants (86.9%) were categorized as having a low risk of OSA, while 12 participants (12.1%) were classified as intermediate risk and 1 participant (1.0%) as high risk.

Conclusion

The study found that 13.1% of the college students were potentially at intermediate or high risk for OSA. These findings underscore the importance of using simple screening tools, such as the STOP-Bang questionnaire, to identify individuals who may benefit from further diagnostic evaluation for OSA, particularly in settings where access to comprehensive sleep studies is limited.

原著論文 113_A94

一地區醫院大腸桿菌菌血症的預後與分析

The investigation of E. coli bacteremia (BSI) in one regional hospital

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Background

E. coli is a common pathogen from blood and urine specimens. BSI is related with higher mortality and morbidity than other sites infection. Our hospital belongs to be a regional, community one which is responsible to take care of elderly and frailty patients. So, we select E. coli BSI for analyzing the primary source, demographic data and outcome for these patients.

Methods

At first, we collect all the bacteria which are isolated from blood culture and search for the primary source of BSI since Jan 1, 2024. Then patients with E. coli BSI are singled out and review the medical records about the demographic data and outcome for these patients.

Results

Results:
There are 872 E. coli isolated from all clinical specimens. E. coli BSI are found from 120 separate patients. Demographic data show 1. male (62) and female (58), 2. above 65y/o (96) and below 65y/o (24), 3. duration of positive culture days are main at 3-5 days, 4. Only 1 carbapenem-resistant E. coli (CREC) BSI. The primary source of BSI are urine (62), sputum (4), bile (4), wound (2), ascites (1) and unknown (18). Outcome of these patients are maybe discharge (93), died (23), admission (2), OPD (1) and refer (1). The mortality rate of E. coli BSI are male above 65y/o (30.6%), female above 65y/o (12.8%), female below 65y/o (9.1%) and male below 65y/o (7.7%).
Discussion:
According to our study, E. coli occupies the most (19.7%) of all bacteria in our clinical specimens. E. coli are the number one from all blood (23.2%) and urine (35.6%) cultures. There are 120 E. coli BSI noted from our cohort and their mortality rate are 19.2%. Male to female ratio is 1.1 to 1. Above to below 65y/o ratio is 4 to 1. Duration of positive culture days between 3-5 days is 95.8%. Most of the primary source of E. coli BSI are from urine (51.7%). Majority of these patients have good outcome (77.5%). Male above 65y/o have higher mortality rate than other

Conclusion

E. coli BSI is a common and treatable disease. CREC BSI is minority (0.8%) at our cohort. Two thirds of E. coli BSI are from urine, sputum, bile, wound and ascites. But one third E.coli BSI belong to be unknown primary origin. Male above 65y/o have higher mortality and need to be aggressive and check early for better outcome.

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多發性微小腺瘤與小腺瘤與復發進階性腺瘤風險之關聯性

Association Between Multiple Diminutive versus Small Adenomas and the Risk of Metachronous Advanced Adenomas

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Background
Patients with previous multiple (≧3) non-advanced (1-9mm) adenomas are at higher risk for metachronous advanced adenoma (>1cm) and consequently have an increased risk of colorectal cancer. There is ongoing debate about whether multiple diminutive (<5mm) adenomas significantly increase the risk. We aim to examine the risk of developing metachronous advanced adenomas from multiple small (6-9 mm) versus diminutive (<5 mm) adenomas.

Methods
Focused on participants who underwent health examinations with two colonoscopies between 2014 to 2020. Adenoma detection rate (ADR) at the initial colonoscopy was 44.31% (2074/4681). 169 patients with metachronous advanced adenoma were categorized into 5 groups based on initial colonoscopy findings.

Results
Patients with advanced adenomas were at the highest risk for advanced metachronous adenomas (18.16%), followed by those with multiple small adenomas (11.19%), multiple diminutive adenomas (8.67%), and lastly, those with 1-2 small adenomas (7.95%). Older age and male gender had a strong correlation with metachronous advanced adenoma ($p < 0.05$). Multiple diminutive adenomas was not significant for developing metachronous advanced adenoma compared to 1-2 small adenomas ($p=0.94$). Multiple small adenomas had a significantly higher risk of metachronous advanced adenoma compared to multiple diminutive adenomas ($p < 0.05$).

Conclusion
The strength of our study is its good ADR (44.31%), indicating fewer missed polyps during the initial colonoscopy and more accurate metachronous advanced adenoma incidence. Post-polypectomy surveillance guidelines should include risk stratification for patients with multiple small versus diminutive adenomas. Current guidelines suggest patients with multiple non-advanced adenomas (1-9mm) should undergo a surveillance colonoscopy in 3-5 years.
For multiple diminutive adenomas (<5mm) we suggest to extended surveillance interval to 5-7 years.