中文題目：安胎藥 Ritodrine 導致之急性肺水腫：病例報告

英文題目： Acute pulmonary edema caused by tocolytic agent, Ritodrine: a case report

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Introduction:

Acute pulmonary edema is a common presentation requiring admission to the intensive care unit. It is a serious medical condition caused by excess accumulation of extravascular fluid in the alveoli of the lungs. Generally, pulmonary edema can be a result of several conditions, including congestive heart failure, infection, and inflammation. During pregnancy or in the postpartum period, the most common cause of acute pulmonary edema included severe pre-eclampsia, multiple pregnancy, use of tocolytic agents, fluid overload and cardiopulmonary disease. Ritodrine hydrochloride is a beta-sympathomimetic agent, which is still a useful drug for tocolysis. However, it may often cause side effects such as tachycardia, hypotension, myocardial infarction, and pulmonary edema. Here, we presented a patient of acute pulmonary edema caused by Ritodrine.

Case presentation:

A 23-year-old woman with history of type 1 diabetes mellitus and preeclampsia presented with progressive shortness of breath on 2022.02.13. She underwent Caesarean section on 2022.02.12 at an obstetrical clinic, where she received tocolysis. Mild dyspnea was complained and then soon exacerbated after delivery, thus she was transferred to our hospital. During tocolysis, 2 ample of Ritodrine in 500 ml 0.9% saline intravenous drip 12 ml/hour was ever used. At emergency department, brief physical examination showed bilateral coarse crackles and lower limbs pitting edema. Chest X-ray showed bilateral perihilar infiltration and multiple nodular densities of bilateral lungs (Figure 1). Laboratory test revealed leukocytosis with white cell count of 20800/uL, anemia with hemoglobin level of 8.2 g/dL, elevated c-reactive protein (CRP) of 80.8 mg/L, proteinuria 1+, hypoxemia with PO_2/FiO_2 of 195.2 mmHg, high D-Dimer of 1069.7 ng/mL, hypoalbuminemia with albumin level of 1.9 g/dL, and high NT-proBNP of 565.5 pg/mL. Enhanced chest computed tomography revealed no evidence of main pulmonary embolism above the segmental branches but bilateral pleural effusion, basal lungs atelectasis with consolidation and bilateral multiple confluent ground glass opacities. Disseminated amniotic embolism was impressed by radiologist. She was then admitted to intensive care unit under the impression of suspect amniotic embolism and acute pulmonary edema. To further differentiate the cause of acute pulmonary edema, including high pulmonary capillary hydrostatic pressure; high pulmonary capillary permeability; and low oncotic pressure due to hypoalbuminemia, patient's perfusion pressure with perfusion and oncotic pressure were evaluated. Consider the clinical presentation of dyspnea during tocolysis and the trend of adequate perfusion pressure and perfusion, amniotic embolism with high pulmonary vascular permeability pulmonary was less likely than

mixed type pulmonary edema including high pulmonary capillary hydrostatic pressure and low oncotic pressure. Negative fluid balance by combination of colloid solution plus diuretic therapy was performed and patient's respiration improved gradually. PO_2/FiO_2 was from195.2 mmHg to 440.0 mmHg. Meanwhile, NT-proBNP was from peak level of 665.2 pg/mL to 431.7 pg/mL. Chest X-ray also demonstrated resolution of pulmonary edema. (Figure 2).

Discussion:

Pulmonary edema is one of a severe complication of when using betamimetic therapy for tocolysis. The incidence was low but it may be lethal. Ritodrine is a beta-2 adrenergic agonist, which can relax the uterus by stimulating beta-2 adrenergic receptors in the uterine smooth muscle. It can also stimulate beta-adrenergic receptors in bronchial and vascular smooth muscle cells, which may cause hypertension, tachycardia, and pulmonary edema. The pathogenesis of Ritodrine related pulmonary edema is still controversial and the cause might be multifactorial. Maternal condition, direct effect of beta agonist, stimulation the renin-aldosterone system, secretion of antidiuretic hormone, excessive crystalloid infusion, and the use of antepartum glucocorticoid are all contributory. Differential diagnoses include pulmonary thromboembolism, sepsis, hyperthyroidism, pneumonia, and amniotic fluid embolism. The management included discontinuation of culprit drug, oxygen therapy support, fluid restriction and intravenous diuretic therapy. Besides, the risk of pulmonary edema was related to infusion rate and dosage of Ritodrine based on previous literature.

Amniotic fluid embolism, which we worried in this case, is an uncommon obstetric emergency, which may result in cardiorespiratory collapse and severe coagulopathy. It is a clinical diagnosis based upon the presence of the typical findings and exclusion of other potential causes. Our case failed to meet all the criteria, inclusive of sudden onset of cardiorespiratory arrest, presence of disseminated intravascular coagulation, absence of fever and clear onset time.

Conclusion:

Use of Ritodrine might cause pulmonary edema during pregnancy or in postpartum period, especially those who have underlying medical problems. In spite of low incidence rate, it should be taken into consideration because it may be fatal.

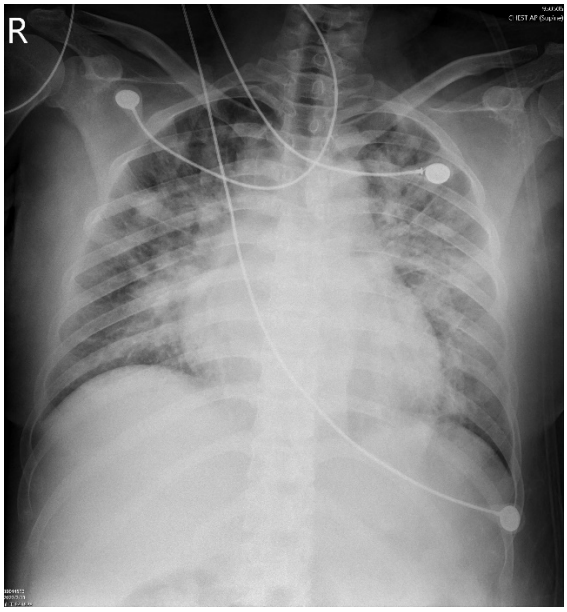

Figure 1.

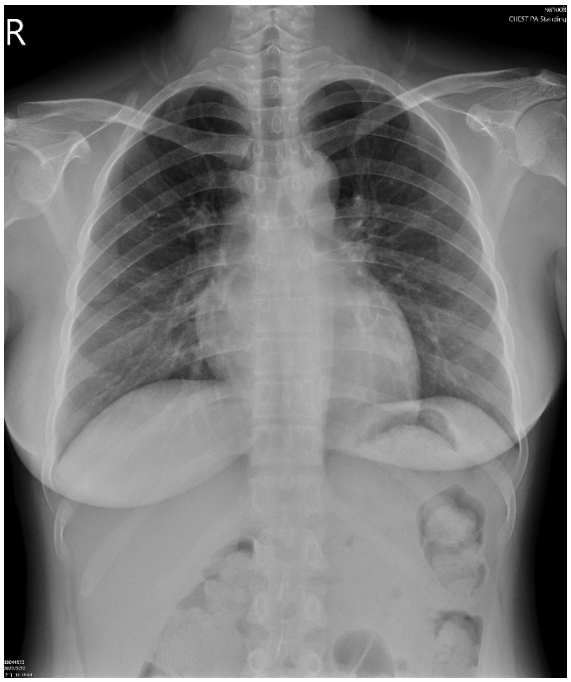

Figure 2.