中文題目：急性白血病患者在中性顆粒細胞減少階段應該多頻繁來監視血液培養？

英文題目：How Often Should Blood Cultures Be Monitored for an Acute Leukemia Patient in Neutropenic Phase?

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Background: Chemotherapy-induced neutropenia makes leukemia patients vulnerable to infections, especially bacteremia. If pathogens could be identified, appropriate antibiotic therapy can be started early. It is uncertain how often should blood cultures be obtained during the neutropenic phase.

Case Report: A 25-year-old previously healthy man suffered from headache, general weakness and dyspnea in recent two weeks. Fever with chillness was noted for 2 days. No chest pain or tarry stool was noted. On the Emergency Room, he was clear with anemic conjunctiva. Laboratory data showed white blood-cell count (WBC), 112,200/μL; hemoglobin, 4.4 g/dL; lymphocyte, 7.2 %; promyelocyte, 18.6 %; platelet count, 7,000/μL and bilirubin (total / direct), 4.85 / 4.43 mg/dL. He was admitted for management on Feb. 28, 2014. Bone marrow study disclosed many granules in blasts, indicating acute myeloid leukemia (non-M3). All-trans-retinoic acid was given. Brain CT was done for headache but no brain lesions were found. Induction chemotherapy with I3A7 regimen (idarubicin + cytarabine) was started since March 10. Neutropenic fever (WBC: 800/μL and platelet count: 47,000/μL) occurred on March 17. Piperacillin-tazobactam and vancomycin were given. Due to unstable hemodynamic status and high fever up to 38.8℃, he was transferred to the intensive care unit on March 18. Antibiotics were shift to vancomycin plus fosfomycin as blood culture yielding methicillin-resistant *Staphylococcus aureus*. On March 20, a new sepsis was suspected as worsening pancytopenia (WBC: 200/μL and platelet count: 9,000/μL). Antibiotics were shifted to imipenem and micafungin after obtaining blood cultures, which then yielded *Klebsiella pneumoniae*. Micafungin was discontinued. On March 22, he was intubated due to unstable hemodynamics and respiratory distress. Fever relapsed for 2 days. Then blood cultures were monitored every day and yielded no growth until March 28, when *K. pneumoniae* bacteremia relapsed and persisted for 4 days. Central venous catheters were removed, but the catheter tip cultures yielded no growth. WBC was 700/μL and platelet count was 29,000/μL. Imipenem plus colistin was used. Then no blood organisms were isolated for 6 days, so blood culture was not monitored since April 6. WBC was 5,300/μL and platelet count was 31,000/μL. However, acute renal failure developed since April 7. Colistin was discontinued. Hyperbilirubinemia (total / direct bilirubin) progressed to 23.67 / 15.39 mg/dL. Abdominal echo showed coarse hepatic echotexture. The blood cultures were obtained on April 9. Despite antibiotics, fluid resuscitation, blood component replacement, G-CSF, inotropic agents and CVVH, the patient died on April 10, 2014. The final blood cultures yielded imipenem-resistant *Pseudomonas fluorescens* and vancomycin-resistant *Enterococcus faecium*.

Conclusion: As difficult to predict septic episodes and pathogens, blood culture was daily monitored for 18 days. However, new untreated bacteremia occurred after two-day interruption for obtaining blood cultures. Daily monitoring blood culture is costly, but may be required throughout the whole neutropenic phase.