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The first case of *Klebsiella pneumoniae* liver abscess with hemophagocytic lymphohistiocytosis

Dear Editor,

Hemophagocytic lymphohistiocytosis (HLH) is a rare, life-threatening condition in which lymphocytes and macrophages underwent uncontrolled activation, followed by excessive cytokine release and inflammation response.[1] HLH can be triggered by immunologically activating events such as infection, neoplastic, or autoimmune processes.[1] Viral infections, such as Epstein-Barr virus, human immunodeficiency virus, herpes virus, and cytomegalovirus are known to be associated with secondary HLH.[2] Bacterial infections causing HLH are less common, with the majority related to *Mycobacterium tuberculosis*.[1] Antibiotic treatment with corticosteroid or chemotherapy were recommended in infection-related HLH.[2,3]

Klebsiella pneumoniae liver abscess is an endemic disease in Taiwan and East Asian countries.[4,5] We described a rare case of *K. pneumoniae* liver abscess with secondary HLH in Taipei Veterans General Hospital.

A 57-year-old healthy man had been well until one week before this admission when fever, chills, and jaundice developed. He is a dentist and has no relevant travel or contact history. On physical examination, his consciousness was clear and was hemodynamically stable. He appeared icteric and the abdomen was tender over right upper quadrant. There was no hepatosplenomegaly or palpable lymphadenopathy. Initial laboratory test demonstrated leukocytosis (white-cell count 33,700/μl, 85% neutrophils), anemia (hemoglobin 7.9 g/dl), thrombocytopenia (platelet 58,000/μl), elevated level of C-reactive protein (14.62 mg/dl), erythrocyte sedimentation rate (28 mm/h), and lactate dehydrogenase (302U/l), and marked hyperferritinemia (17,994.4 ng/ml). Acute kidney injury (blood urea nitrogen 116 mg/dl, creatinine 10.85 mg/dl) and liver failure (total bilirubin 42.47 mg/dl, direct bilirubin 38.28 mg/dl, albumin 2.4 mg/dl, and prothrombin time 20.6 s) were found. Blood sugar, lactate and ammonia levels were within normal limits. Computed tomography of abdomen disclosed two abscesses formation in both lobes of liver with the larger being 5.4 × 4 cm in diameter. The *K. pneumoniae* isolated from the aspirated pus was susceptible to a number of classes of antibiotics, except for an intrinsic resistance to ampicillin by the VITEK 2 system (bioMérieux). This strain was hypermucoviscous, positive for *rmpA* and *rmpA2* and belonged to capsular genotype K1.

Marked hyperferritinemia, thrombocytopenia, and liver failure aroused the suspicion of HLH and HLH was confirmed by increased histiocytes by CD68 and CD163 stains in the biopsy from bone marrow with hemophagocytosis in the marrow aspirate. The survey for autoimmune diseases and malignancy was unremarkable. Viral, mycobacterial and fungal infection were excluded after extensive microbiological examinations.

The patient received meropenem initially and then moxifloxacin for liver abscess. Methylprednisolone (1 mg/kg/day) was administered after the diagnosis of HLH. The jaundice and prolonged prothrombin time improved dramatically, and anemia and thrombocytopenia recovered. He underwent renal replacement therapy for several days and acute kidney injury recovered. He received a total of ten weeks of antibiotics, and the ferritin level was 1023.5 ng/ml 28 weeks after the diagnosis of HLH.

We firstly demonstrated a case of *K. pneumoniae* liver abscess associated with secondary HLH successfully treated with antibiotic and steroid. Physicians in the endemic area of *K. pneumoniae* pyogenic infection should be alert to this devastating complication, and further study exploring the association between *K. pneumoniae* infection and HLH is necessary.

Conflicts of interest

All authors declare no conflicts of interest.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jmii.2018.10.012.

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