

Endogenous endophthalmitis complicating *Klebsiella pneumoniae* liver abscess in Europe: case report

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Received: 29 June 2006 / Accepted: 14 May 2007 / Published online: 1 August 2007
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Abstract *Purpose:* To report the first European case of endogenous endophthalmitis secondary to a liver abscess due to *Klebsiella pneumoniae* expressing MagA gene. *Methods:* A 33-year-old diabetic patient was admitted for fever and right upper quadrant abdominal pain. Abdominal computed tomography and laboratory studies were performed. On day 4 after admission, patient complained of a painful and red right eye with decreased vision. A complete ophthalmological examination, including visual acuity assessment, slit lamp examination and fundus ophthalmoscopy was started. *Results:* *Klebsiella pneumoniae* liver abscess was diagnosed and antibiotherapy initiated. Polymerase chain reaction

revealed that the isolated *Klebsiella pneumoniae* was serotype K1 and positive for Mag A. Ophthalmological examination disclosed cells in the anterior chamber and an important vitritis. Fundus was barely visible. A diagnosis of *Klebsiella pneumoniae* endogenous endophthalmitis complicating liver abscess was made. Intravitreal injection of antibiotics resulted in a preservation of visual acuity. *Conclusion:* This report suggests that rather than being confined to Taiwan, endogenous endophthalmitis secondary to a liver abscess due to *Klebsiella pneumoniae* expressing MagA gene, is becoming a global problem.

Keywords Endophthalmitis · Virulence factor

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Introduction

Endogenous endophthalmitis is a rare but devastating disease. Recent reports have suggested that the incidence is increasing among Asian populations mainly in Taiwan, where the major source of infection in the past 20 years has been liver abscess, with *Klebsiella pneumoniae* as the causative organism [1–3]. To our knowledge, this has rarely been described outside Asia [4–7]. Here, we report the case of a Belgian man who presented in Brussels with the typical association of endogenous endophthalmitis and *K. pneumoniae* septicemia secondary to a hepatic abscess, in a diabetes mellitus setting.

Case report

A 33-year-old man with history of poorly controlled insulin-dependent diabetes was admitted with a 1-week history of fever and right upper quadrant pain. He had already been treated with amoxicillin-clavulanate. The patient, a Belgian of Moroccan origin, has never travelled to Asia. On admission, body temperature was 36.7°C and there was a right upper quadrant abdominal tenderness. Laboratory studies disclosed the following values: haemoglobin, 12.8 g/dl; white blood cells count, 13,600/mm³ and a blood glucose level of 234 mg/dl. An abdominal computed tomography scan showed a low density lesion in the right lobe of the liver suggestive of liver abscess (Fig. 1). These findings led to the diagnosis of pyogenic liver abscess for which drainage was performed. Pus samples and blood cultures were positive for *K.pneumoniae* resistant to ampicillin and sensitive to other commonly used antibiotics. The patient was treated with levofloxacin 500 mg IV 12 h and ornidazole 1 g orally per day. On day 4 after admission, an ophthalmic examination was performed as the patient complained of a painful and red right eye with decreased vision. The best corrected visual acuity was 5/10 in the right eye and 8/10 in the left. A slit lamp examination revealed cells in the right eye anterior chamber, posterior synechiae, an important vitritis, the fundus was barely visible. A diagnosis of endogenous endophthalmitis was made and an intra-vitreous injection of ceftazidime 2.25 mg was administered associated with topical ceftazidime (50 mg/ml) hourly as well as prednisolone acetate 1% four



Fig. 1 Abdominal computed tomographic scan showing a low density lesion in the liver suggestive of liver abscess

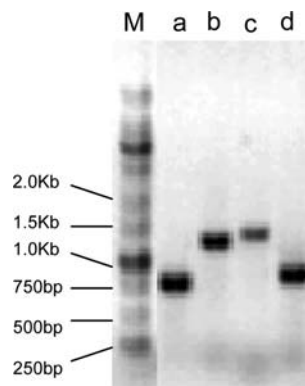


Fig. 2 PCR for *magA*. Four primers have been used to detect the presence of *magA* (lane a–d) during a Dot-Blot Hybridization and nested PCR

times daily and atropine 1% twice daily. A strain of *K. pneumoniae* was sent to the department of microbiology at National Taiwan University College of Medicine, where it was proven to be serotype K1 and positive for mucoviscosity-associated gene A (*magA*) (Fig. 2). On day 11, the visual acuity in the right eye was still 5/10 while slit lamp examination demonstrated reduced anterior chamber activity as well as reduction of vitritis. Visualisation of the fundus was better and revealed a background retinopathy. On day 12, the patient suddenly insisted on being discharged. He was discharged with levofloxacin 500 mg p.o 12 h, prednisolone acetate 1% 6 h and a mixture of short and medium-acting insulin. On day 30, the patient came for a control and the situation was stabilized. A longer follow-up was impossible since the patient never came back.

Discussion

Endogenous endophthalmitis is an infectious process involving intra-ocular tissue. It is caused by haematogenous spread of pathogens in patients with septicemia. Most cases of endogenous endophthalmitis are due to fungal infection and gram positive bacteremia in patients with immunosuppression, diabetes, indwelling intravenous catheter or intravenous drug abusers [3, 8].

Community-acquired *K. pneumoniae* septicemia, associated with liver abscess and frequently complicated with endophthalmitis, has been a recurrent disease in Taiwan [1–3]. This condition is frequently

associated with diabetes, which is considered as the most important predisposing factor [9]. In 2002, Fung et al. revealed that *K. pneumoniae* serotype K1 (capsular antigen) was significantly associated with liver abscess and endophthalmitis [1]. Recently, Fang et al. have identified a novel virulence gene in *K. pneumoniae* strains causing primary liver abscess [10]. Typically, these strains are characterized by the formation of elongated mucoviscous strings when a loop is passed through a colony. Hence the gene was named mucoviscosity-associated gene (*magA*). Furthermore, the *K. pneumoniae* strain which carries the *MagA* gene is highly resistant to human serum and phagocytosis killing, suggesting an increased pathogenicity and virulence. Our strain of *K. pneumoniae* was serotype K1 and positive for *MagA*.

This report suggests that, rather than being confined to Taiwan, *K. pneumoniae* liver abscess complicated with endophthalmitis is becoming a global problem. In order to make a precise diagnosis and provide adequate therapy in cases of endogenous endophthalmitis, the combined effort of the internist, the microbiologist and the ophthalmologist is definitely required.

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