Journal of Infection and Public Health xxx (2017) xxx–xxx

Contents lists available at ScienceDirect

Journal of Infection and Public Health

journal homepage: http://www.elsevier.com/locate/jiph

Multiple brain abscesses due to *Enterobacter cloacae* in an immune-competent child

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ARTICLE INFO

Article history:
Received 10 October 2016
Received in revised form 7 March 2017
Accepted 25 March 2017

Keywords:
Neuroinfection
Enterobacter
Brain abscess
Pyogenic
Carbapenems

ABSTRACT

Brain abscesses due to Enterobacteriaceae in immune-competent children are rare, and those due to *Enterobacter cloacae* are even rarer. We report an interesting case of community-acquired *E. cloacae* neuroinfection resulting in multiple brain abscesses in a young child with no underlying risk-factors. A 10 year-old-boy presented with low-grade fever, headache, neck pain and progressive deterioration of sensorium. On examination, he was conscious but drowsy with photophobia, normal fundii, meningeal signs, mild hypertonia, brisk muscle stretch reflexes and extensor plantar responses. Magnetic resonance imaging of brain showed bilateral, multiple pyogenic abscesses. Culture of the abscess material aspirated at the time of surgical drainage showed growth of *E. cloacae.* He received intravenous imipenem for 18 weeks guided by clinical and radiological response. A pragmatic approach combining early surgical drainage, targeted antimicrobial therapy and patient-tailored duration based on the clinico-radiological response is needed in such difficult cases.

Introduction

Brain abscesses due to Enterobacteriaceae in children are rare, and those due to *Enterobacter cloacae* are even rarer. *E. cloacae* is a common, gram-negative bacillus in the intensive care units (ICUs). Transmission is almost exclusively nosocomial; community-acquired infection is rare in children in the absence of predisposing conditions such as hematological malignancies, immunosuppressive drugs, post-transplant or burn, cerebrospinal fluid (CSF) shunt complication, prolonged hospitalization or invasive procedures [1,2].

We discuss a case of community-acquired *E. cloacae* multiple brain abscesses in an immune-competent child with no underlying risk-factors. The clinical problems encountered in managing such cases are discussed.

Case

A 10 year-old-boy presented with intermittent, low-grade fever and diffuse, dull-aching headache for eight days followed by neck pain, progressive deterioration in sensorium and irrelevant speech. There was no history of trauma, ear discharge, respiratory problems, contact with tuberculosis patient, chronic debilitating illness or repeated hospitalizations. Family history was unremarkable. On examination; he was conscious but drowsy with symmetrical and equally reacting pupils, photophobia, normal fundii, meningeal signs, mild hypertonia, brisk muscle stretch reflexes and extensor plantar responses. Rest of the cranial nerves, sensory, cerebellar, extrapyramidal and spine examination was normal. System examination was non-contributory. A clinical possibility of subacute meningoencephalitis was considered.

Laboratory investigations showed hemoglobin 107 g/L, total leukocyte count 22,400 cells/μL (neutrophils 82%, lymphocytes 11%, monocytes 6%, eosinophils 1%), platelet count 405,000 cells/μL, prothrombin time (PT) 23 s (normal 12–14 s), activated partial thromboplastin time (aPTT) 25 s (normal 25–32 s), prothrombin index 61%, international normalized ratio 1.4 and normal fibrinogen and D-dimer levels. Serum electrolytes, renal and liver function tests and urine microscopic examinations

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http://dx.doi.org/10.1016/j.jiph.2017.03.008

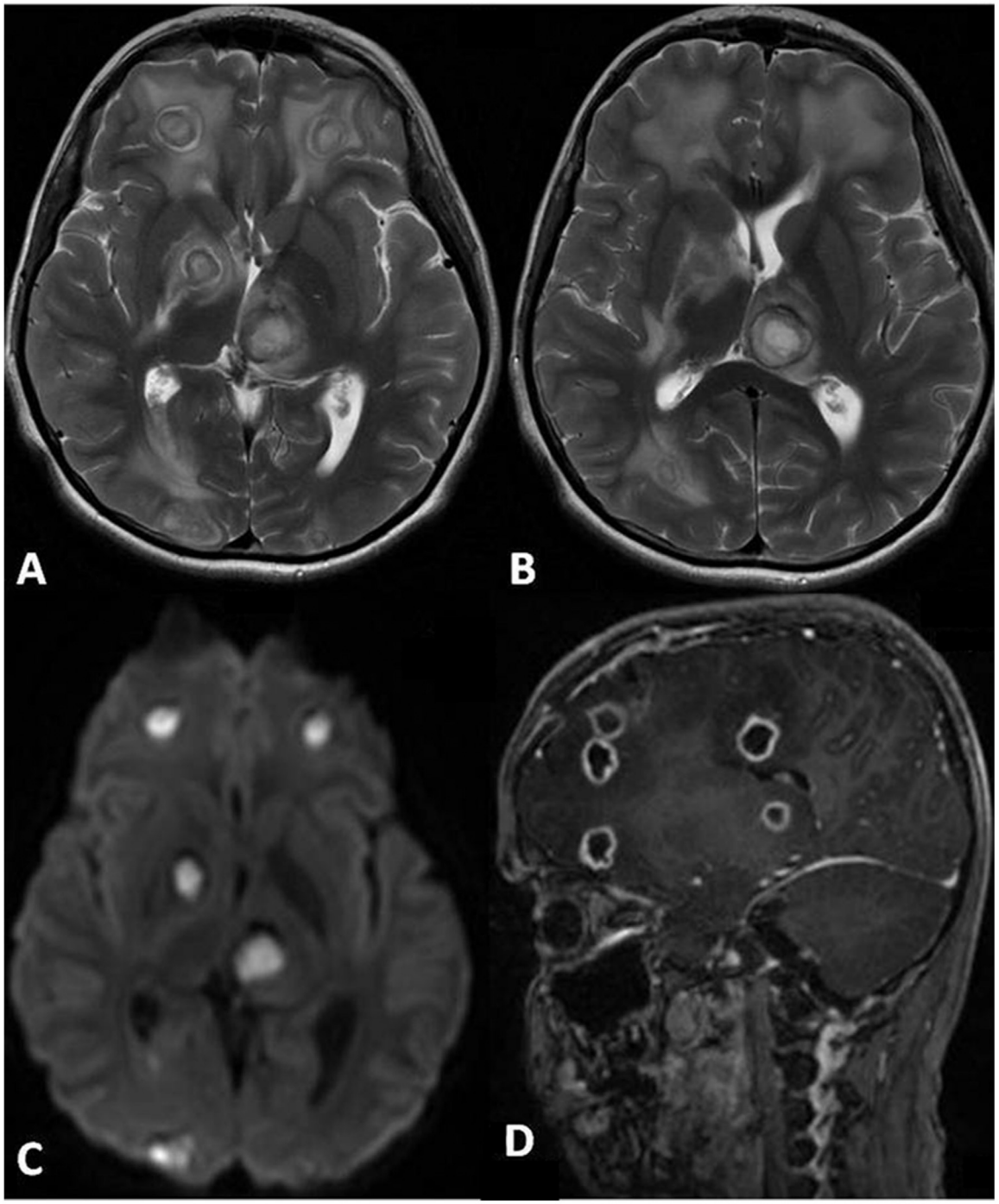

Fig. 1. MRI brain: axial T2 weighted (A and B), diffusion weighted (C), and sagittal contrast-enhanced T1 weighted (D) images demonstrate multiple ring-enhancing lesions in both cerebral hemispheres and left thalamus showing central diffusion restriction and moderate perilesional edema suggestive of pyogenic abscesses.

were normal. CSF and repeated blood cultures were sterile. Contrast-enhanced magnetic resonance imaging (CE-MRI) of the brain revealed multiple brain abscesses (Fig. 1A–D). He was empirically started on intravenous ceftriaxone (100 mg/kg/day in two divided doses), cloxacillin (200 mg/kg/day in four divided doses), and metronidazole (45 mg/kg/day in three divided doses). Antibodies against toxoplasma, hydatid, amoeba and human-immunodeficiency virus in the serum were negative. Echocardiography, paranasal sinus radiographs, abdominal ultrasonography, otologic and dental examinations did not reveal any occult source of infection. Immunoglobulin profile including IgG-subclass, serum C3 and C4 levels, CH50 activity, nitrosozo blue tetrazolium and dihydrorhodamine tests were normal. Left frontal microcraniotomy with drainage and excision of the abscess showed 8 mL of frank pus. Gram-stain demonstrated gram-negative bacilli and culture showed growth of *E. cloacae* (sensitive to pipercillin, amikacin, imipenem; resistance to cefotaxime). Histopathological examination of the abscess-wall revealed neutrophils and fibrin collection, proliferating blood vessels and reactive gliosis in adjacent brain tissue suggestive of a pyogenic abscess. The child was subsequently administered intravenous imipenem (60 mg/kg/day in 3 divided doses 8 hourly). He showed gradual recovery. After

Please cite this article in press as: Saini AG, et al. Multiple brain abscesses due to *Enterobacter cloacae* in an immune-competent child. J Infect Public Health (2017), http://dx.doi.org/10.1016/j.jiph.2017.03.008