Pediatric bacterial meningitis in southern China: analysis of 838 cases

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Background

Bacterial meningitis (BM) is a severe infectious disease, especially for neonates and children, resulting in high mortality and morbidity associated with diagnosis and treatment delay[1].

Therefore, early diagnosis and appropriate antibiotic treatment are important for BM patients. Although the incidence of BM caused by Streptococcus pneumoniae, Neisseria meningitidis and Haemophilus influenzae has decreased significantly worldwide in the past two decades with the use of vaccines for these three pathogens, BM is still a common acute devastating infection for neonate and children[2].

In addition, sometimes inappropriate use of antibiotics leads to atypical changes in the cerebrospinal fluid (CSF) of partial BM patients, making timely diagnosis difficult[3].

Introduction

In this study, we reported the clinical features of 838 children diagnosed with BM. We also explored the risk factors of admission to the intensive critical unit (ICU), brain parenchymal involvement, subdural effusion and hearing impairment in a national, regional tertiary medical center from southern China in the past 6 years (from 2012 to 2018).

Materials and Methods

Clinical data of children diagnosed with BM from October 2012 to September 2018 from one national regional medical center were analyzed retrospectively. Clinical outcome was defined as clinical status on the day of discharge, and the outcome was graded with the Glasgow outcome scale (GOS). The sequela was evaluated for survived patients at the last follow-up.

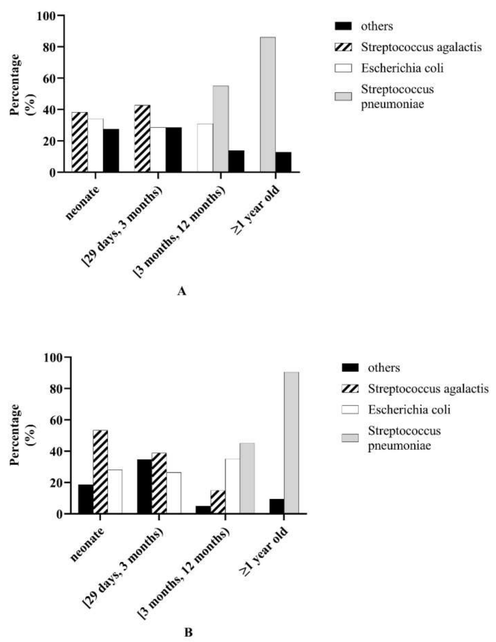

Chart 1. The bacterial culture results in patients of different ages. (A) The cerebrospinal fluid bacterial culture results in patients of different ages. (B) The blood bacterial culture results in patients of different ages

Results

838 patients (M/F=1.8:1) were enrolled. 90.6% of patients were under one year old.
The common symptoms included fever, seizure, etc. 88.1% of patients had CSF WBC increase while 86.8% and 96.9% of patients had CSF glucose decrease and protein increase respectively. 38.7% of patients were positive in bacterial culture, with the most common bacteria Streptococcus agalactis, Escherichia coli, and streptococcus pneumoniae. 80.1% and 52.2% of patients had abnormal brain MRI and BAEP, with threshold increase most commonly seen. 1.2% and 0.4% of patients were combined with CSF fistula and immunodeficiency respectively. Complications included subdural effusion, ependymitis, hyponatremia. Antibiotic meropenem combination with another antibiotic was the most commonly used. For the score Glasgow outcome scale at discharge, 92.0% of patients got 5 points. The total fatality rate was 1.9%. 10.7% of surviving patients at follow-up had sequela with delayed motor development most commonly seen. And 1.6% of surviving patients at follow up experienced recurrent BM with Streptococcus pneumoniae being the most common bacteria. Some risk factors associated with ICU admission, brain parenchymal involvement, subdural effusion and hearing impairment.

Conclusions

of pediatric BM in southern China: more than 90% of patients archiving good outcomes at discharge, with fatality rate relatively low and around10% of patients having neurological sequela.

References

[1] Lucas MJ, Brouwer MC, van de Beek D. Neurological sequelae of bacterial meningitis. J Infect. 2016;73(1):18-27. doi: 10.1016/j.jinf.2016.04.009. PubMed PMID: 27105658.

[2] McIntyre PB, O'Brien KL, Greenwood B, van de Beek D. Effect of vaccines on bacterial meningitis worldwide. The Lancet. 2012;380(9854):1703-11. doi: 10.1016/s0140-6736(12)61187-8.

[3] Subspecialty Group of Neurology tSoPCMA. [Expert consensus on diagnosis and treatment of community acquired bacterial meningitis in children]. Zhonghua Er Ke Za Zhi. 2019;57(8):584-91. doi: 10.3760/cma.j.issn.0578-1310.2019.08.003. PubMed PMID: 31352742.