

Etiology of childhood meningitis in northeastern Poland, 2017

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Background and aims

In 2014 we observed an outbreak of enteroviral meningitis (EM) caused by Echovirus 30, which resulted in over 300 cases of meningitis. In this study we aimed to evaluate the etiology of childhood central nervous system (CNS) infections 3 years after the outbreak, in 2017.

Methods

The study is a retrospective analysis of medical records of children with meningitis hospitalized in the Department of Pediatric Infectious Diseases at the Medical University of Białystok in 2017. Enteroviral meningitis, varicella zoster meningitis (VZM), and herpes simplex encephalitis (HSE) were diagnosed based on the detection of viral genetic material in CSF. The diagnosis of Lyme neuroborreliosis (LNB) and tick-borne encephalitis (TBE) was confirmed by the detection of specific antibodies in serum and CSF samples. The diagnosis of bacterial meningitis (BM) was confirmed in CSF or blood culture.

Results

In 2017 there were 67 cases of CNS infections in children (33% girls, 77% boys, Figure 1) aged 1 month to 17 years. The male to female ratio was 2.0:1. EM comprised the majority of cases (n=34, 51%). Twenty-seven (79%) cases of EM were boys. Vector-borne CNS infections were identified in 23 (34%) children (13 boys and 10 girls): TBE was diagnosed in 14 children (21%), and LNB in 9 (13%) children. Six (67%) LNB cases presented with facial nerve palsy. Bacterial meningitis was diagnosed in 5 children (7%). Other causes of CNS infections were rare (Figure 2a). Regarding BM cases there were 2 infants with group-B streptococcal meningitis, one 6-year-old boy with invasive pneumococcal disease, one 11-year-old boy with meningococcal sepsis and one infant with bacterial sepsis of unknown etiology. In further analysis of EM cases, 11 different strains of enteroviruses were identified (Figure 2b). Remarkably, enterovirus A71 C2 was identified in one child, but the infection was mild and not associated with any complications.

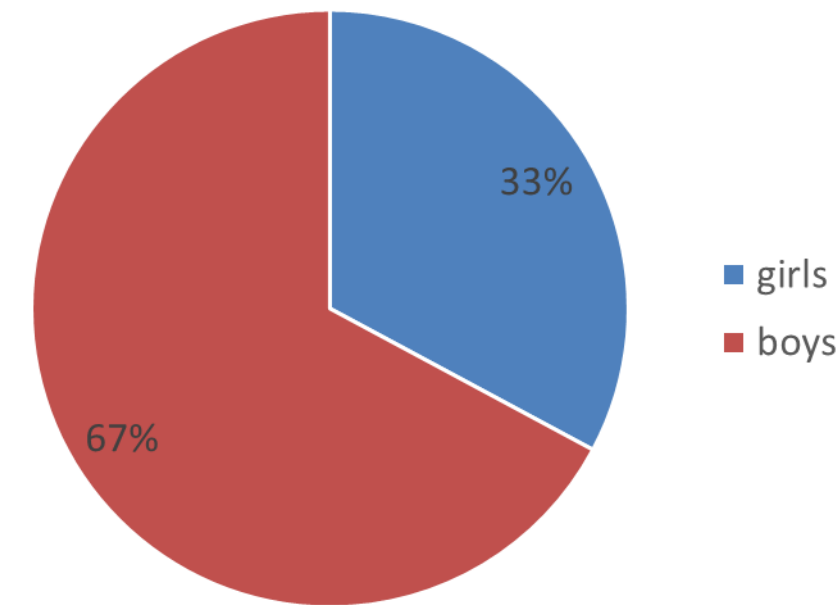


Figure 1. The gender differences in children hospitalized with meningitis in 2017 in Białystok

Conclusions

As opposed to 2014, in 2017 the etiology of childhood CNS infections was more diverse. As much as 34% of CNS infections were vector-borne indicating that clinicians need to include NB and TBE in differential diagnosis of aseptic meningitis. Lyme neuroborreliosis should be suspected particularly in children with facial nerve palsy.

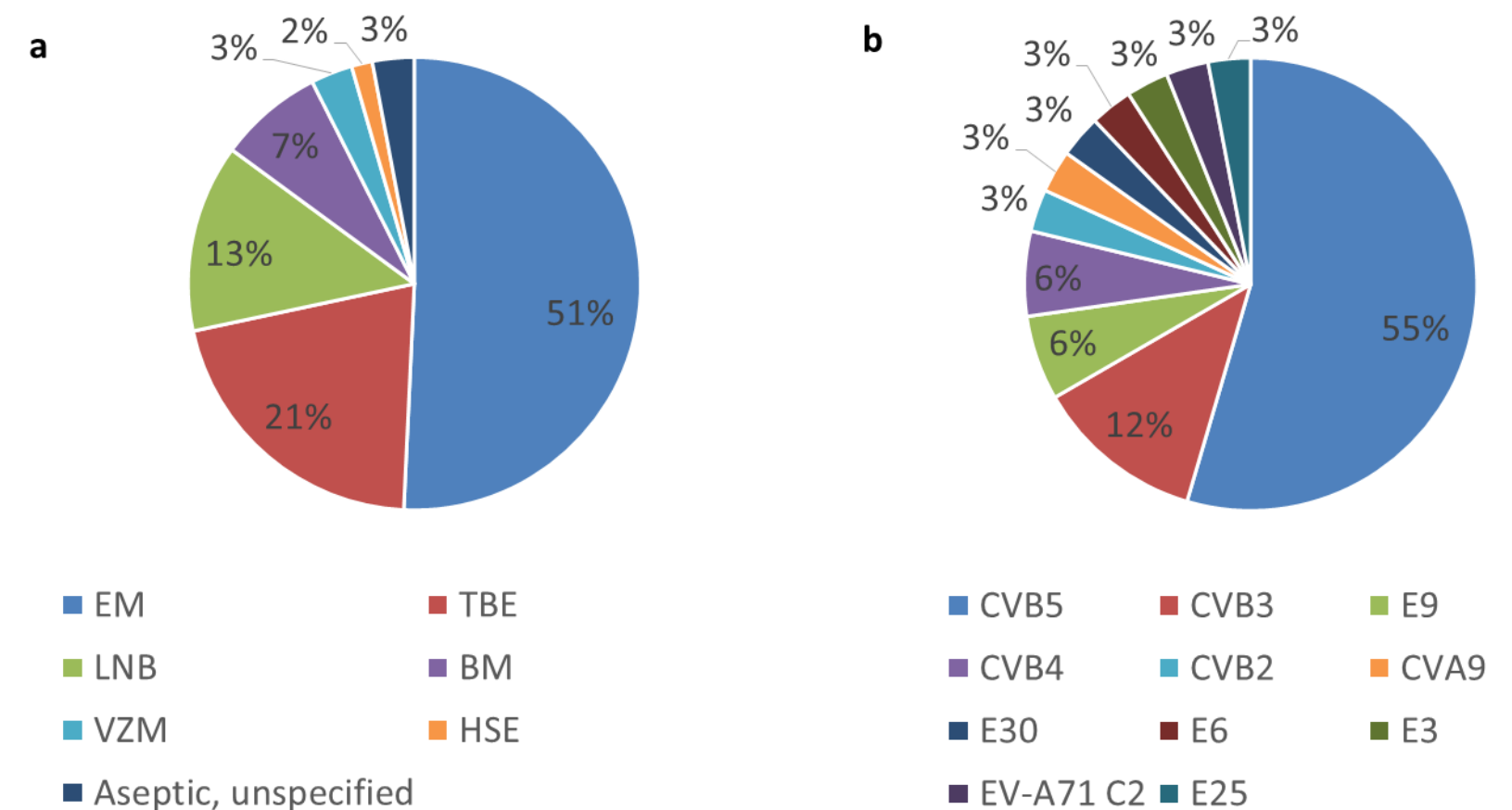


Figure 2. The etiology of neuroinfections in children hospitalized in 2017 in Białystok, Poland (a) and strains of enteroviruses detected in children with enteroviral meningitis