

## Assessment of cases of aseptic meningitis among children

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**Abstract**

**Background:** Aseptic meningitis refers to a clinical syndrome of meningeal inflammation in which common bacterial agents cannot be identified in the CSF. The present study was conducted to assess cases of aseptic meningitis in children. **Materials & Methods:** 56 children diagnosed with aseptic meningitis of both genders were enrolled. Clinical presentation, laboratory findings in blood and CSF, duration of antimicrobial therapy, days of hospitalization, and outcome was recorded. **Results:** Out of 56 children, boys were 32 and girls were 24. The mean duration of fever was 24.6 hours, duration of hospitalization was 4.2 days, antimicrobial therapy >2 days was seen in 13, antimicrobial therapy <2 days in 33 and no antimicrobial therapy in 10. WBC counts / mm<sup>3</sup> was 11810, lymphocytes >50% in 30, hemoglobin (mg/dl) was 12.4 and C-reactive protein was 7.6 mg/dl. **Conclusion:** Aseptic meningitis is commonly seen among infants and children, hence careful analysis of case should be done.

**Key words:** Aseptic meningitis, antimicrobial therapy, Children

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**Introduction**

Aseptic meningitis refers to a clinical syndrome of meningeal inflammation in which common bacterial agents cannot be identified in the CSF[1]. Non-polio human enteroviruses (NPHEV) are the leading recognizable cause of aseptic meningitis accounting for 80% to 92% of all cases in which a pathogen is identified. Enteroviruses constitute a genus of the picornavirus family which includes poliovirus types 1, 2, 3, and human enterovirus A, B, C, and D[2]. The NPHEV can cause a broad spectrum of illnesses such as febrile disease, hand-foot-mouth, herpangina, aseptic meningitis and encephalitis. Occasionally, NPHEV can cause severe infection with dismal outcome such as myocarditis and neonatal sepsis. Most of the cases occur in epidemics during summer and autumn although sporadic cases can occur throughout the year[3].

Meningitis generally is classified into aseptic versus bacterial, based on etiology. Aseptic meningitis predominantly is caused by viruses, usually is a diagnosis of exclusion based on the lack of bacterial findings, and generally has lower rates of case fatality and neurologic sequelae[4]. Bacterial meningitis, although less common than aseptic meningitis, carries a greater risk of morbidity and mortality. In low- and middle-income countries, case fatality rates from bacterial meningitis range from 22%-73% depending on the setting and if there is access to appropriate care. Additionally, approximately one-half of the children who survive bacterial meningitis develop neurologic sequelae, which include intellectual deficits, behavioral problems, and hearing loss[5]. The present study was conducted to assess cases of aseptic meningitis in children.

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E-mail: [drsaifpaeds@gmail.com](mailto:drsaifpaeds@gmail.com)**Materials and methods**

The present study comprised of 56 children diagnosed with aseptic meningitis of both genders. Parental consent was obtained before starting the study.

Data such as name, age, gender etc. was recorded. Clinical presentation, laboratory findings in blood and CSF, duration of antimicrobial therapy, days of hospitalization, and outcome was recorded. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

**Results****Table 1: Distribution of patients**

Total- 56		
Gender	Boys	Girls
Number	32	24

Table 1, Fig. 1 shows that out of 56 children, boys were 32 and girls were 24.

**Discussion**

Globally, meningitis is estimated to kill 164 000 children each year. In India approximately 52000 children die each year from meningitis; this accounts for 2% of all deaths in children. Rapidly identifying bacterial meningitis is critical for proper treatment and maximal outcomes. The key to diagnosis of bacterial meningitis is timely lumbar puncture (LP) to identify bacteria or their markers[6]. However, the clinical presentation of meningitis in infants, who comprise the bulk of cases of pediatric meningitis, is nonspecific compared with symptoms seen in older children or adults and can be similar to other febrile illnesses. Furthermore, the clinical presentations of bacterial and aseptic meningitis are similar, making identification of bacterial pathogens in the cerebrospinal fluid (CSF) critical[7]. Because meningitis can result in fatality and high rates of sequelae, clinical signs with high sensitivity and poor specificity are used to ensure that all cases are often captured. In India, the clinical and laboratory picture of meningitis is further complicated by the widespread availability of antibiotics, reducing the utility of standard microbiological methods in confirming bacterial meningitis and in formulating appropriate treatment difficult[8].

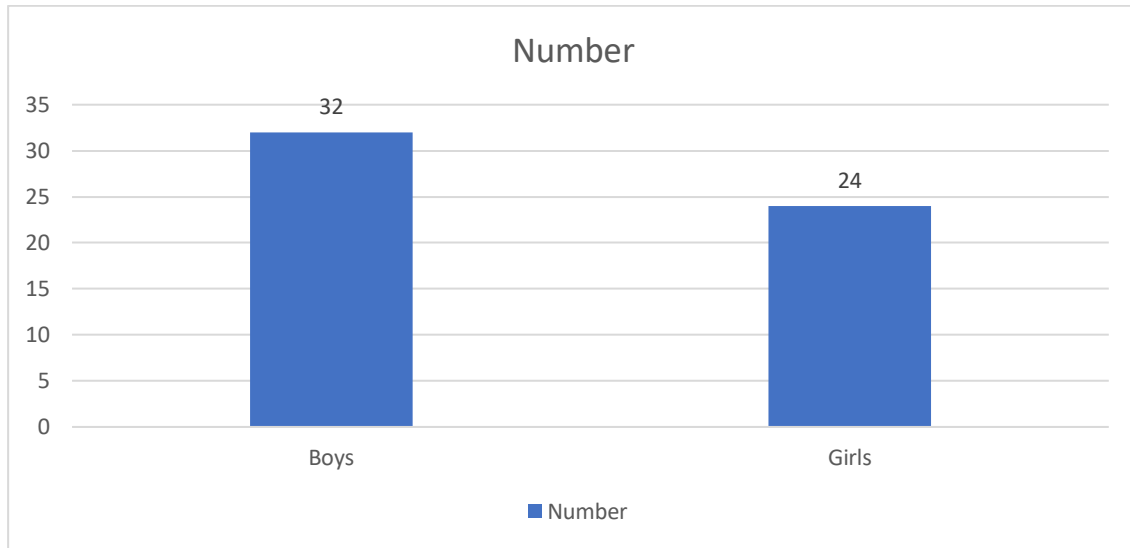


Fig. 1: Distribution of patients

Table 2: Assessment of parameters

Parameters	Mean
Duration of fever (Hours)	24.6
Duration of hospitalization (Days)	4.2
Antimicrobial therapy >2 days	13
Antimicrobial therapy <2 days	33
No antimicrobial therapy	10
WBC counts / mm <sup>3</sup>	11810
Lymphocytes >50%	30
Hemoglobin (mg/dl)	12.4
C-reactive protein, mg/dl	7.6

Table 2 shows that mean duration of fever was 24.6 hours, duration of hospitalization was 4.2 days, antimicrobial therapy >2 days was seen in 13, antimicrobial therapy <2 days in 33 and no antimicrobial therapy in 10. WBC counts / mm<sup>3</sup> was 11810, lymphocytes >50% in 30, hemoglobin (mg/dl) was 12.4 and C-reactive protein was 7.6 mg/dl.

Antibiotics are known to rapidly sterilize the CSF, making identification of bacterial by culture problematic. Additionally, the impact of pre-treatment with antibiotics on other laboratory indicators of meningitis, such as the total white blood cell (WBC) count, glucose, or protein in the CSF, are not consistent, which makes the differentiation of bacterial versus aseptic meningitis difficult[9].The present study was conducted to assess cases of aseptic meningitis in children.

Lawrence et al[10] assessed the clinical and laboratory features of suspected meningitis to assist in the accurate diagnosis of bacterial meningitis in young Indian children. A total of 2564 children with suspected meningitis were enrolled over 45 months; 156 cases of aseptic and 51 cases of bacterial meningitis were identified. Stiff neck and bulging fontanelle were more common in bacterial meningitis (P < .05), but were present in 54% and 74% cases of aseptic meningitis. Culture and gram stain were positive in 7 (14%) and 4 (8%) cases of bacterial meningitis.

We found that mean duration of fever was 24.6 hours, In present study, out of 56 children, boys were 32 and girls were 24. duration of hospitalization was 4.2 days, antimicrobial therapy >2 days was seen in 13, antimicrobial therapy <2 days in 33 and no antimicrobial therapy in 10. WBC counts / mm<sup>3</sup> was 11810, lymphocytes >50% in 30, hemoglobin (mg/dl) was 12.4 and C-reactive protein was 7.6 mg/dl. Curtis et al[11] found that of 14145 references initially identified, 10 met our inclusion criteria. On history, a report of bulging fontanel (likelihood ratio [LR]: 8.00 [95% confidence interval (CI): 2.4-26]), neck stiffness (7.70 [3.2-19]), seizures (outside febrile-

convulsion age range) (4.40 [3.0-6.4]), or reduced feeds (2.00 [1.2-3.4]) raised concern about the presence of meningitis. On examination, jaundice (LR: 5.90 [95% CI: 1.8-19]), being toxic or moribund (5.80 [3.0-11]), meningeal signs (4.50 [2.4-8.3]), neck stiffness (4.00 [2.6-6.3]), bulging fontanel (3.50 [2.0-6.0]), Kernig sign (3.50 [2.1-5.7]), tone up (3.20 [2.2-4.5]), fever of >40°C (2.90 [1.6-5.5]), and Brudzinski sign (2.50 [1.8-3.6]) independently raised the likelihood of meningitis. The absence of meningeal signs (LR: 0.41 [95% CI: 0.30-0.57]) and an abnormal cry (0.30 [0.16-0.57]) independently lowered the likelihood of meningitis. The absence of fever did not rule out meningitis (LR: 0.70 [95% CI: 0.53-0.92]).

Navtej et al[12] assessed the cases of aseptic and bacterial meningitis in children. 48 Children aged >30 days to <24 months of clinically suspected meningitis were enrolled. Aseptic and bacterial meningitis cases were compared. Simple seizure was seen 13 in aseptic cases and in 10 in bacterial meningitis, complex seizure in 12 and 13 cases in aseptic and bacterial meningitis respectively., altered consciousness in 12 and 13 in aseptic and bacterial meningitis respectively, fever in 22 and 17, stiff neck in 11 and 7, bulging fontanelle in 6 and 3, shock in 8 and 5 and rash in 15 and 12 cases respectively. The difference was significant (P< 0.05)

**Conclusion**

Authors found that aseptic meningitis is commonly seen among infants and children, hence careful analysis of case should be done.

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