Original Article

Association of Meningitis among Children with First Attack of Fever and Seizure without Clinical Manifestations of Meningitis

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ABSTRACT

OBJECTIVES: To determine the association of meningitis among children 1-18 months of age with first attack of fever and seizure but examination finding of meningitis are absent.

METHODOLOGY: This Descriptive (cross sectional) Study with Consecutive non-probability sampling technique was carried out at Pediatric Department, Ayub Teaching Hospital Abbottabad from 2nd August 2014 to 3rd February 2015. A total of 165 children with fever and seizure but examination findings of meningitis were absent included in this study.

RESULTS: This study reveals that 35% children were in age range 1-6 months; 40% children were in age range 7-12 months and 25% children were in age range 13-18 months. Average age was 8 months with standard deviation ±1.26. Sixty percent children were male while 40% children were female. The status of meningitis was analyzed as the frequency of meningitis in children with fever and seizure without symptoms of meningitis was 3%.

CONCLUSION: In this study, we saw the association of meningitis amongst children with fever and seizure without signs of meningitis were 3% which showed that meningitis may present with fever and seizures in the non-appearance of symptoms of meningitis which leads to the significances of missing solitary case of meningitis is dreadful and the early detection may avert sinister consequences.

KEY WORDS: Meningitis, fever, seizure, clinical manifestations.

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INTRODUCTION

Seizures are frequent alarming neurologic disorder in childhood and account for about 1% of all emergency departments' visits. Among possible causes of first seizure attack in children are infections, traumatic head injury, toxins, neurologic, and metabolic intrruptions[1].

Febrile illness is the significant cause of seizures for the first time. Febrile seizures are mostly witnessed to occur amongst 5% of children falling in the age group of six months to five years with having a minimum temperature of 38°c and above not because of infection of central nervous system or any metabolic unevenness, which occurs without any history of afebrile seizures previously[2,3].

Fever and seizure may be due to febrile seizure or more serious condition like meningitis. Meningitis is the inflammation of leptomeningeal membranes and the subarachnoid space and caused by bacteria, viruses, protozoa and fungi. The incidence of meningitis is 30% in children under 12 months of age[4]. In young children meningitis may present with history of irritability, decreased feeding, tiredness, prolonged seizure, focal or generalized seizure, altered consciousness and or neurological deficit may result in profound consequences. Hence, it is very indispensable (crucial) to eliminate meningitis amongst all children with having febrile seizures[4,5].

Several researchers are of the opinion that meningitis may present with fever and seizures in the absence of signs of meningitis. In current practice, lumbar puncture in infants with febrile seizures without clinical symptoms of meningitis is not obligatory. Therefore, American academy of pediatrics has changed its criteria of 1996 about lumbar puncture in children under 1 month of age in 2009 as if any infant falling in the age group of 6-12 months present with seizure and fever, a lumbar puncture is optional when the child is considered having deficiency of H influenza type B or streptococcus pneumonia immunization or when history of immunization is not known, because of increased risk of bacterial meningitis[6,7].

This study intends to determine the frequency of meningitis among children of age group 1-18 months with occurrence of first attack of fever and seizures without clinical manifestation of meningitis because the consequences of missing even solitary case of meningitis will be dreadful and the early detection may avert sinister consequences.

METHODOLOGY

This Descriptive (cross sectional) Study with

Consecutive non-probability sampling technique was carried out at Pediatric Department, Ayub Teaching Hospital Abbottabad from 2nd August 2014 to 3rd February 2015.

Sample Size: The total sample size was 165 as per WHO formula for sample size calculation by taking the expected frequency of meningitis in children with fever and seizure without symptoms of meningitis is 3% with 95% confidence interval. All the children of both gender in age range 1-18 months with first attack of fever and seizures, without clinical manifestation of meningitis admitted in Pediatric Department in Ayub Teaching Hospital Abbottabad. Meningitis child presenting with fever and seizures, if he/she has combination of all three of the following in CSF routine examination. WBCs > 5/mm³, Proteins > 40mg % and Sugar < 2/3rd of blood sugar. Children with cerebral palsy, mental retardation, brain malformation, trauma, with previous seizure or on antibiotics for a period of more than 48 hours were not included.

All new cases with first attack of fever and seizures above 1 month and under 18 months of age were enrolled. Informed written consent was taken from parents. Children were assessed by researcher by detailed history following by detailed clinical examination. All children were subjected to lumbar puncture.

SPSS version 16 was employed for quantitative data analysis to calculate Mean and Standard Deviation for variables such as gender and age. Meningitis was stratified in two variables gender and age to determine the outcome of modification. Results of statistical tests were reported in the tables and then discussed.

RESULTS

This study was carried out at Pediatric Department, Ayub Teaching Hospital Abbottabad. A total of 165 children were observed to determine the frequency of meningitis among children 1-18 months of age with first attack of fever and seizure without clinical manifestations of meningitis and the results were analyzed. Age of 165 children was distributed amongst age groups as 58(35%) children were in age range 1-6 months, 66(40%) children were in age range 7-12 months and 41(25%) children were in age range 13-18 months. Average (Mean) age was 8 months with standard deviation ±1.26.

Gender distribution of observed sample of children was reported as 99(60%) children were male while 66 (40%) children were female.

Status of Meningitis amongst 165 children was analyzed as the number of meningitis in children with fever and seizure without signs of meningitis was 5 (3%) shown in table No I.

Stratification of Meningitis with distribution of two key variables gender and age of children is given in Table No II & III, the CSF findings of positive cases given in table IV.

TABLE I: FREQUENCY OF MENINGITIS WITH FIRST ATTACK OF FEVER AND SEIZURE WITHOUT CLINICAL MANIFESTATIONS OF MENINGITIS (n=165)

Meningitis	Frequency	Percentage
Yes	05	03%
No	160	97%

TABLE II: STRATIFICATION OF MENINGITIS WITH AGE DISTRIBUTION (n=165)

Meningitis	1-6 Month	7-12 Month	13-18 Month	Total
Yes	02	02	01	05
No	56	64	40	160

Chi square Test was employed in which P value was reported as 0.003

TABLE III: STRATIFICATION OF MENINGITIS WITH GENDER DISTRIBUTION (n=165)

Meningitis	Male	Female	Total
Yes	03	02	05
No	96	64	160
Total	99	66	165

Chi square Test was employed in which P value was reported as 0.002

TABLE IV:
PATIENTS WITH POSITIVE CSF REPORT

CSF finding	1-6 Month		7-12 Month		13-18 month
WBC mm³	40	500	10	120	60
Proteins > 40mg %	145	75	70.5	95	45
Sugar < 2/3rd of blood sugar	26	22	34	55	35

DISCUSSION

Standard protocol for evaluating child having seizures with fever or without fever is same. Assessment criteria include history, presence of continuing illness, recent medication like antibiotics/immunizations or hospitalization. Less than 3 months old infants were about 10% with fever more than 100.4° F (38° C) have been found meningitis or serious bacterial infection. Infants and children of the age above three months with a temperature above 102.2° F (39° C) are diagnosed with bacteremia were 2% percent[8-10].

In this study 35% children were in age range 1-6 months; 40% children were in age range 7-12 months and 25% children were in age range 13-18 months. Mean age was 8 months with standard deviation ±1.26. Sixty percent children were male while 40% children were female. The status of meningitis was analyzed as the frequency of meningitis in children with fever and seizure without signs of meningitis was 3%. Similar results were found in other studies as Teach SJ 1999[12] observed 3% incidence of meningitis amongst children with fever and seizure but no clinical sign of meningitis.

Trainor JL 2001[13] had cited the frequency of meningitis amongst children with fever and seizure without signs of meningitis as 2% Shah SS et al had shown the incidence of meningitis amongst children with fever and seizure without signs of meningitis as to be 4%[11-13]. Pal DK 2003[15] had observed that none of children has bacterial meningitis were suffering from fever and seizures even bacteremia with Streptococcus pneumoniae was found in 3%, urinary tract infection in 1%[14]. While Daoud AS 2002[16] focusing on only Proper immunization is also being a significant cause of declining the rate of occurrence of Streptococcal bacteremia and meningitis[15].

Tarkka R 2003[17] & Luszczak M 2001[18] had found 1-2% meningitis amongst children of age under 18 months with febrile seizures in view of routine lumber puncture even no finding of meningitis on general physical examination. Warden CR 2003[19] had conducted a study based on laboratory measurement of serum electrolyte levels, and concluded it more effective in excluding signs and symptoms of a simultaneous illness, such as diarrhea or vomiting[16-19].

CONCLUSION

In this study, the frequency of meningitis amongst children with fever and seizure without signs of meningitis was 3% which shows that meningitis may present with fever and seizures in the absence of signs of meningitis which leads to the results of missing even a solitary meningitis case can be dreadful and early detection may avert sinister consequences.

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