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Clinico-Epidemiological Study of Non-Tumor Non-Traumatic Neurological Disorder in Paediatric Patients in a Tertiary Referral Teaching Centre

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Abstract
Background: *India accounts for more than 1/5th of world's tuberculosis cases. We highlight the importance of making an effort to identify children more prone to develop acute neurological complications and neurological sequelae, so that a multidisciplinary team may plan a long-term follow-up and assure an adequate rehabilitation of those patients. The objectives of the present study were to evaluate the epidemiological and clinical or etiological factors in non-tumor non-traumatic paediatric patients, to characterize these children from a clinical point of view, and to identify clinical variables with potential to predict neurological sequelae and complications.*
Material and Method: *This was a observational cross-sectional study, consisting of consecutive 105 patients admitted in Department of Paediatrics, Neta ji subhash Chandra bose medical college Jabalpur (MP), India.*
Result- *In our study, out of 105 cases 52.38% were male and 47.62% female. age wise distribution of patients were 1-4 year 38.10%, 5-9 year 36.19%, 10-14 years 25.71%. regarding ^{2nd} objective in our study, out of 105 cases 31.43% were tubercular meningitise,24.76% cerebral malaria, 20.96% seizure disorder, 14.29% viral encephalitise , 5.71% pyogenic meningitise CONCLUSION- Based on results of the present study, it is possible to conclude that the most common CNS infection is tubercular meningitise which is preventable disease. It is prevented by antitubercular prophylaxis , vaccination and awareness regarding diseases..*
Key Worlds: *Non-Tumor Non-Traumatic Paediatric Patients only.*

Introduction

In spite of the availability of preventive vaccines and effective antibiotics, bacterial meningitis remains a significant cause of morbidity and mortality in the United States. In the United States,

the overall annual incidence of meningitis is between 2 and 10 cases per 100,000.[1] Due to the successful implementation of vaccines for bacterial meningitis, *Haemophilus influenzae* type b and *Streptococcus pneumoniae (S. pneumonia*), *Neisseria meningitides* is now the leading cause of bacterial meningitis in the United States, particularly in infants less than 1 year of age.[2,3] Surveillance in the United States from 1998 to 2007 showed a total of 2262 cases of meningococcal disease, with 50.2% of those cases being meningitis.[4] Despite the availability of appropriate treatment, the case fatality rate from meningococcal meningitis during that time period in United States was 9.0%. Numerous sequelae have been noted in survivors of childhood

bacterial meningitis including seizure disorders, focal neurologic deficits, hearing/vision loss, and impaired cognitive functioning.[1] Sequelae vary based primarily on the etiologic agent, but overall, approximately 25% of survivors in the United States have moderate or severe sequelae.[5–7] Several studies have described and quantified these sequelae, supplementing patient experiences with detailed neurologic exams, and studies.[6,8–10] Studies have also begun to elucidate the economic costs (both on individual and societal levels) associated with bacterial meningitis.[11] These data will help to further inform recommendations for conjugate vaccines against common etiologic agents of meningitis[16]. Bacterial meningitis is a serious and potentially life threatening CNS infection. It often results in disabling or deaths in 170,000 patients each year worldwide. Younger children are predominantly at risk of bacterial meningitis, mainly because of their immature immune systems and malnutrition while lack of immunization practices also makes them more susceptible to significantly high morbidity & mortality. (Anderson, V. et al., 2004). Even with the provision of highly effective antibiotic therapy, death and long-term disabilities are the common but still seroius consequences of acute bacterial meningitis in developing countries. Common neurological complications in adult are hearing loss, motor deficit, cognition defect and speech problem, whereas sensorineural deafness, followed by seizure disorder and motor deficit are more common in children. Sixteen
percent of pediatric patients from developed countries have neurological complications, while this figure rose 26 percent from developing countries[17].Two third of all pediatric deaths due to meningitis occur in low income countries and as many as 50% survivors of childhood meningitis experience some neurological sequel. Neurological complications of meningitis can occur at any time during the course of disease and even after the completion of therapy. Neurological complications may either be focal or generalized or it may be of sudden or gradual in onset. Patients either remain conscious or may present with altered consciousness or even coma. Usually the complications develop during the course of acute bacterial meningitis but some of them manifest or persist as the long-term sequel such as; hearing loss, epilepsy, hemiplegia, neuropsychological impairment, developmental and learning disabilities. Shock or disseminated intravascular coagulation, frequently is associated with meningococcal meningitis. Pneumococcal meningitis is associated with the highest case fatality rate. Apnea and respiratory failure may occur with any bacterial meningitis, especially in infants. Post meningitis complications may occur in almost half of all cases, 81% of them may present with neurological sequel. A part of this may present with systemic sequel, while a quarter of them have both neurological and systemic complications[17].

Aims and Objectives

1. To Study Epidemiology of Non-Tumor Non-Traumatic Neurological Disorder in Paediatric Patients.
2. To Study Prevalence of Clinical Sub-Types in Non-Tumor Non-Traumatic Neurological Disorder in Paediatric Patients.

Material and Methods

This was an observational cross-sectional study, consisting of consecutive 105 patients admitted in department of Paediatrics, Neta ji subhash Chandra bose medical college Jabalpur (MP), India from September,2006 to august, 2007. All 1 year to 14 year patients with clinical symptoms and sign suggestive of neurological illness which was confirmed by laboratory and radiological investigation and ready to give consent for lumbar puncture and imaging studies were included in study. Patients with history of trauma, tumor, toxin exposure, metabolic couse, neurological insult (birth asphyxia, cerebral palsy) or any contraindication for MRI/CSF were excluded from study.

Observations

Table 1 Clinico-Epidemiological Profile of Patients

[A] Age Wise Distribution Of Patients			
S. No.	**Age In Year**	**No of Patients**	**Percent**
1	1-4	40	38.10 %
2	5-9	38	36.19 %
3	10-14	27	25.71 %
[B] Gender Wise Distribution			
1	Male	55	52.38 %
2	Female	50	47.62 %
[C] Diagnosis Wise Distribution			
1	Tubercular Meningitise	33	31.43 %
2	Pyogenic Meningitise	6	5.71 %
3	Cerebral Malaria	26	24.76 %
4	Viral Encephalitise	15	14.29 %
5	Seizure Disorder	22	20.95 %
6	Others	3	2.86 %
Total		105	100 %

Results & Discussion

In our study, out of 105 cases 52.38% were male and 47.62% female. age wise distribution of patients were 1-4 year 38.10%, 5-9 year 36.19%, 10-14 years 25.71%[TABLE-1].In a study of NON TRAUMATIC COMA IN CHILDREN in the year 2005 by bansal et[12] all in PGIMER chandigarh, india, out of total cases were 65% male while 35% female and age wise distribution of cases were ,less than 1years -15%,1-3 years – 25%, 4-9 years – 34%, more than 10 years 26%. Result of our study was same as BANSAL et al[12] for age wise and gender wise distribution of patients means male predominance and cases were almost equal in number in age group 1-4 years & 5-9 years.

In our study, out of 105 cases 31.43% were tubercular meningitise, 24.76% cerebral malaria, 20.96% seizure disorder, 14.29% viral encephalitise, 5.71% pyogenic meningitise [TABLE-1] In a study of non traumatic coma in children in the year 2005 by BANSAL et[12] all in PGIMER chandigarh, India, out of total cases 60% were central nervous system infection and out of them tubercular meningitise was the leading cause 19% followed by viral encephalitise 18% and acute pyogenic meningitise 16% found.

On comparing this study with our we found that tubercular meningitise remains the leading cause of childhood neuro infection in india followed by cerebral malaria, seizure disorder, viral encephalitise. The relative percentages of tubercular meningitise cases were much higher in our study as compared to study by BANSAL et[12] all (31.43% vs 19%). this variation may be because of demographic and socioeconomic profile of the patients catered by the two hospital.

RAMESH et all[13] in year 1997 in the same institute found out neuro infection 56% to be the most common cause of non traumatic coma in children. Out of cns infection the incidence of tubercular meningitise, cerebral malaria, seizure disorder, viral encephalitise were nearly equal in their work.

In other study from CHINA[14] the most common cause of intracranial hypertention and cerebral oedema were found to be neuro infection.

The importance of neuro infection etiology in non traumatic coma in children is in sharp contrast to adult hospital based series where degenerative and cerebrovascular pathologies dominates. However the type of infection seems to vary in different regions for example cerebral malaria in AFRICA, dengue haemorrhagic fever in SOUTH EAST ASIA.[15]

Conclusion

Our study shows prevalence of non-tumor non-traumatic neurological illness is in the males predominance and most commonly affected age group is the 1- 9 years [74.29%]. Which is same as were found in previous studies and the most important cause of non traumatic coma in children is CNS infection more specifically tubercular meningitise .Some higher prevalence values urge for effective prevention control measures and stricter follow up procedures. In a community where CNS infection prevalence is higher needs adoption of further precautionary measure to reduce morbidity and mortality in non traumatic coma in children patients.

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