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DEMOGRAPHIC PROFILE OF ACUTE FEBRILE ENCEPHALOPATHY CASES IN PEDIATRIC AGE GROUP PATIENTS: A STUDY FROM WESTERN RAJASTHAN

Medical Microbiology

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ABSTRACT

Acute Febrile Encephalopathy is a clinical term used to describe patients presenting with short febrile illnesses with altered mental states. Demographic distribution plays an essential role in the diagnosis of viral etiologies. One hundred five suspected AFE cases were enrolled in the study. A detailed history by predesigned performa and laboratory investigations was obtained for data collection. Viral etiology was diagnosed in 32 (30.48%) cases. The male to female ratio was 1.39:1. Total 56.25% of positive cases were from the lower class, 28.13% from the middle class, and 15.63% from the upper class. 24 (75%) cases from rural, while only 8 (25%) of the urban population showed viral etiologies. In 19 (59.4%) cases were either history of incomplete vaccination or not vaccinated, 13 (40.6%) cases had a history of complete immunization among positive cases. The predominant clinical feature was fever (100%) followed by seizures 66(62.86%), vomiting 37(35.24%), headache 14(13.33%), paresis in 16(15.24%) and altered sensorium in 29(27.62%), respectively. To conclude, the etiologic panorama of AFE varies with several factors such as time and demographical location, age, and immunization status. There is an urgent need to conduct more studies to profile the viral etiologies according to their prevalence in geographical areas so the treatment can be tailored accordingly and prophylaxis treatment or immunization can be boosted in the population at risk of getting the disease.

KEYWORDS

Acute Febrile Encephalopathy, Pediatric patient, Demographic

INTRODUCTION

Acute Febrile Encephalopathy (AFE) is a clinical term used to describe patients presenting with short febrile illnesses with altered mental states. (1) AFE is often fatal, or neurological sequelae follow recovery. Mortality and morbidity are very high in children with AFE if left untreated or timely treatment are not started. Demographic distribution plays an essential role in the diagnosis of viral etiologies. Identification of causative agents is critical in tailoring treatment for a better outcome. In Asia, Japan, China, Korea, Philippines, Taiwan, and India are endemic regions for JE virus disease. In JE surveillance, up to 4,000 cases are reported in India alone every year. But It is observed that most AFE cases in India are due to non-JE etiology in the country. (2) Herpes virus, Dengue, Measles, Mumps, Varicella-Zoster, Chandipura virus also contribute to a large proportion of AFE disease. In recent literature, other viruses also have been reported to cause diseases such as Enterovirus, B19-Parvovirus, and Epstein bar virus. (3,4) Due to lack of resources, infrastructure, and awareness, most of the other etiologies cases are undiagnosed or not reported in the surveillance program.

The present study was conducted to find the clinical profile and demographic pattern of viral etiologies causing AFE in Western Rajasthan.

METHODS AND MATERIALS:

This study was conducted in the Department of Microbiology, Dr S. N. Medical College, Jodhpur Rajasthan. One hundred five pediatric patients suspected with AFE between age 1 month to 15 years due to viral etiologies were enrolled in the study. Approval of the Institutional ethical committee was obtained before conducting the study.

INCLUSION CRITERIA:

Patients who agreed to give consent for enrolment were included in the study.

EXCLUSION CRITERIA:

- Suspected cases of bacterial, fungal, or mycobacterial encephalitis were excluded from the disease.
- Patients with a history of CNS disorders or congenital anomaly.

CSF samples were collected to perform serological and molecular tests. IgM antibody capture ELISA and Multiplex RT-PCR were performed to detect viral etiologies. A detailed history by predesigned performa and laboratory investigations was obtained for data collection.

RESULT:

All (105) cases were studied for viral etiology, out of which 32(30.48%) samples were positive for one or more viruses, whereas 73(69.52%) of cases remained undiagnosed.

The mean age of male patients were 6.083.87 years and mean age for female patents were 6.434.27. The male to female ratio was 1.39:1 with male predominance.

The socioeconomic class was assessed according to the Kuppuswamy scale.(5) 56.25% of positive cases were from the lower class, 28.13% from the lower middle class, and 15.63% cases were from the upper middle class. No viral etiologies were diagnosed in upper class population.

Viral etiologies were more common in the rural population in comparison to the urban population. Prevalence of viral etiology was more in males than females. 19(59.4%) cases were either history of incomplete vaccination or not vaccinated. 13(40.6%) cases had a history of complete immunization, according to the National immunization program of India. [Table 1] The study was conducted in tertiary care hospital in Jodhpur, which is also a referral centre for nearby district hospitals. Fifty percent [n=16] of the cases of confirmed acute encephalopathy cases were from Jodhpur, and the rest were from neighboring districts.

Table 1: Demographic Profile of AFE cases in present study.

Variables	Group	Number of Positive cases (32)
Gender	Male (Mean+SD)	6.083.87
	Female (Mean+SD)	6.434.27
Socioeconomic Group	Upper middle class	5(15.63%)
	Lower middle class	9(28.13%)
	Lower class	18(56.25)
Demography	Rural	24(75%)
	Urban	8(25%)
Vaccination status	Vaccinated	13(40.60%)
	Incomplete vaccination or Not Vaccinated	19(59.4%)

21.85% [n=7] were from Barmer, 12.5% [n=4] from Pali, 6.25% [n=2] from Jalore and Nagaur each and 3.13% [n=1] from Jaisalmer. [Map 1]

Map 1: Viral etiology in Western Rajasthan

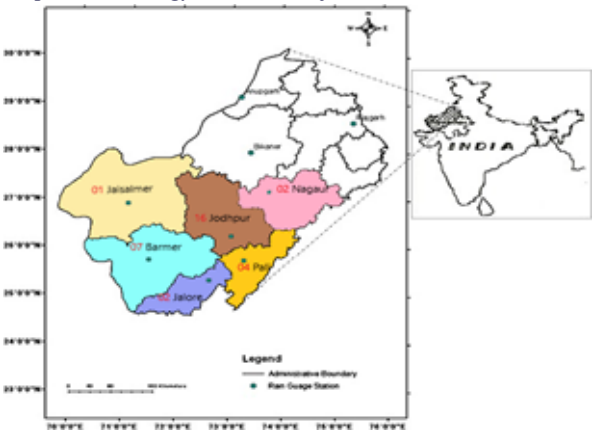

Table 2: Clinical Profile of Patients with Suspected AFE Cases

Clinical features	Total
Fever	105(100%)
Altered sensorium	29(27.62%)
Seizures	66(62.86%)
Paresis	16(15.24%)
Headache	14(13.33%)
Vomiting	37(35.24%)

The predominant clinical feature was fever (100%) followed by seizures 66(62.86%), vomiting 37(35.24%), headache 14(13.33%), paresis in 16(15.24%) and altered sensorium in 29(27.62%) respectively.

DISCUSSION:

The infective agents include a wide range of bacteria and viruses that can also vary according to the geographical location, climate, season, and host factors. Although viruses are assumed to be significant pathogens, most cases remain undiagnosed. Thus a wide variation exists in the viral etiological agents across the globe and even in the same continent. In this study 32% of cases were diagnosed as having viral etiology, which is similar to earlier reports from a study conducted by, Das *et al* at West Bengal (29.81%)(6) however, other studies reported higher positivity; Ramamurthy *et al* at Karnataka (60%)(7) and Karmarkar et al at New Delhi (71.92%)(8) whereas, other studies showed lower prevalence, Rathore *et al* at Odisha (17.2%),(9) Beig *et al* at Uttar Pradesh (21.83%)(10).

This study group comprised mean age of male patients 6.083.87 and female 6.43 4.27 years. The male to female ratio was 1.39:1. Prevalence of viral etiologies was more in males than females. Another studies across country also had male predominance in their studies.(4,11,12) 56.25% of positive cases were from lower class, 28.13% from lower middle class, and 15.63% cases were from upper middle class. A study by Kakoti et al. observed that majority of the patients belonged to a lower socioeconomic group (63%).(13) In another study by Kamble *et al*, more than one third of cases were from upper lower class 52(38.2%) followed by 37(27.2%) from upper middle class.(12)

Out of the total study population, 68(64.76%) belong to rural areas, whereas 37(35.24) were from urban areas. Among these, 24(30.47%) had confirmed viral etiology while etiology remained unknown in 44(41.9%) in rural population. Maximum positivity for viral agents was showed in rural population 24(30.47%). Similarly a study conducted by Das *et al* revealed that majority of patients (89.3%)in their study was from rural areas. (11) Another study by Jordan *et al* maximum samples were (74.23%) from rural areas.(14)

In present study 19(59.4%) cases were either history of incomplete vaccination or Not vaccinated. 13(40.6%) cases had a history of complete immunization. Similarly vaccination status of 7.5% of children was not known and majority of the affected children were not vaccinated (80.5%) in study report of Kakoti et al.(13)

13 (40.6%) cases had a history of complete immunization among positive cases. The predominant clinical feature was fever (100%) followed by seizures 66(62.86%), vomiting 37(35.24%), headache 14(13.33%), paresis in 16(15.24%) and altered sensorium in 29(27.62%) respectively. A similar observation was made by Sapkal *et al* in patient age ranged from <1 month to 15 years showed fever and altered sensorium in 100%. (3) and Verma *et al* showed fever (97.6%), vomiting (54.8%), abnormal altered sensorium (95.2%), seizure (47.6%) respectively.(15)

In present study rural patients were predominated the urban patients, due better sanitization, better education of parents, better health awareness and facilities, better vaccination guidance and easy approach to Tertiary care reference hospitals.

CONCLUSION:

It can be made out from present study that there is high prevalence of viral etiologies in Western Rajasthan; however, the most commonly reported JE virus was not detected in our study. Most of the cases were from 0-5 years and the rural area with male predominance. Vaccination is the primary key in preventing viral disease; however, 60% of populations were either non-vaccinated or incompletely vaccinated in our study. To conclude, the etiologic panorama of AFE varies with several factors such as time and demographical location, age, and immunization status. There is an urgent need to conduct more studies to profile the viral etiologies according to their prevalence in geographical areas so the treatment can be tailored accordingly and prophylaxis treatment or immunization can be boosted in the population at risk of getting the disease.

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