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A CROSS-SECTIONAL STUDY OF ACUTE BACTERIAL MENINGITIS IN ADMITTED CHILDREN BELOW TWELVE YEARS OF AGE IN A TERTIARY CARE TEACHING HOSPITAL IN PUNE, INDIA

Introduction

Bacterial meningitis is associated with significant morbidity and mortality, hence accurate information is necessary regarding the important etiological agents and populations at risk to ascertain public health measures and ensure appropriate management. The community incidence of acute bacterial meningitis in India is not known. The exact etiological diagnosis is often not possible, because of poor culture facilities, prior antibiotic therapy, delay in plating for culture, non-availability of media with uniform quality, and low bacterial load. There are limited studies from India regarding the etiology and epidemiological factors associated with acute meningitis. There is a need for a periodic review of bacterial meningitis worldwide, since the pathogens responsible for the infection vary with time, geography, and patient age. Increased awareness, availability, and usage of vaccines may also reflect as a change in the epidemiological pattern of these pathogens. So therefore, there was conducted the study with the aim to study the various epidemiological factors of acute meningitis.

Goal

To study some epidemiological factors of acute meningitis.

Material and methods of research

This was a cross-sectional study undertaken in the paediatric- indoor patient department (IPD) of a tertiary care teaching hospital in Pune, India. Inclusion criteria for suspected meningitis were all the admitted cases during the study period below 12 years of age with the history of sudden onset of fever more than 38.5°C rectal or more than 38.0°C axillary and the presence of one or more of the following such as neck stiffness, altered consciousness, meningeal sign. Inclusion criteria for children below 1 year of age was fever accompanied by bulging fontanelle. The purpose of the study was explained to the parent /guardian of the child and informed consent was taken before enrolling them in the study. Parents who did not give consent for the study were excluded from the study. Information regarding vaccination and history of contact with a case of meningitis was obtained. Detailed clinical examination was done. Blood samples and cerebro spinal fluid samples were taken from the study subjects. Fisher's exact test was used to study the association and values of $P < 0.05$ were considered as statistically significant. The duration of the study was 1 year.

The results of the research and their discussion

Based on the above-mentioned criteria there were 79 suspected cases of meningitis, 37 cases (46.8%) were less than 1 year age, 22 cases (27.9%) were between 1 to 5 years age and 20 cases (25.3%) were between 5 to 12 years of age. Thus, majority of cases (74.7%) were under-fives. The mean age was 2.7 years with a standard deviation of 3.2 years. The male to female ratio was 1.82:1. There were 44 (55.6%) cases from urban area and 35 (44.4%) cases from rural area. The total number of deaths among the cases were 11. The case fatality rate

(CFR) was thus 13.9% with a confidence interval ranging from 5.9 to 21.5%. As seen in Table 1, in both the male and female cases, the age-specific mortality was highest in children below 1 year age, CFR being 25% in males and 15.4% in females. In 1.1 to 5 years age-group, the CFR in males was 7.7% and zero in females. The CFR in the age-group 5.1 to 12 years was found to be higher (14.3%) than 1.1 to 5 years age-group in males, but it was zero in females. The association between the age and the mortality was not statistically significant. (Fisher exact test, P = 1). The CFR in males (17.6%) was higher than in females (7.1%) but the difference was not statistically significant (Fisher exact test, P = 0.311). Based on the culture examination done on blood and CSF there were 16 cases of confirmed bacterial meningitis [Table 2]. There was not a single sample with more than one isolate. There was no case who was positive in both (CSF and blood culture. Commonest isolate was Klebsiella pneumoniae as seen in five cases (31.2%). Non fermenters accounted for four cases (25%). Not a single case had received Meningococcal vaccine, Haemophilus b vaccine (Hib), pneumococcal vaccine. As per the history given 15 cases (18.9%) gave the history of exposure to a case of meningitis. All the cases were from the low socioeconomic status.

Table 1 – Age and sex-specific mortality in cases of meningitis

YEARS	MALE			FEMALE		
	Cases	Deaths	CFR	Cases	Deaths	CFR
0 to 1	24	6	25%	13	2	15.4%
1.1 to 5	13	1	7.7%	9	0	0
5.1 to 12	14	2	14.3%	6	0	0
TOTAL	51	9	17.6%	28	2	7.1%

Table 2 – Laboratory diagnosis of the meningitis cases

Organisms	CSF culture positive	Blood culture positive	Total
Klebsiella pneumonia	2	3	5
Non-fermenters	3	1	4
Streptococcus pyogens	2	1	3
Coagulase negative staphylococci (CONS)	–	2	2
E. coli	–	1	1
Citrobacter freundii	1	–	1
TOTAL	8	8	16

Conclusions

In the present study the 37 cases (46.8%) were less than 1 year age. As per the hospital-based study in India in children aged 1 month to 5 years suffering from acute bacterial meningitis, 77.7% were below the age of 1 year. The male to female ratio in the present study was 1.82:1. The case fatality rate as seen in the present study was 13.9% with a confidence interval ranging from 5.9 to 21.5%. This clearly indicates the grave nature of the disease. In the present study, out of 79 suspected cases of meningitis, only 16 cases were confirmed based on CSF culture or blood culture result. Klebsiella pneumoniae was the commonest isolate (31.3%) in the present study followed by non-fermenters (25%), Streptococcus pyogenes (18.8%), coagulase negative staphylococci (12.5%), and E. coli, Citrobacter freundii each in 6.3% cases. In the present study the most important finding was that Neisseria meningitides, H. influenzae, or Streptococcus pneumoniae were not isolated in any case. Reasons for non-isolation could be low incidence of the above-mentioned pathogen in the present study area. Etiological pathogens do differ from region to region. In the present study, Haemophilus influenzae and Neisseria meningitides

were not isolated. Other Gram-negative bacilli, Streptococcus spp., and Staphylococcus aureus were isolated from 19 (4.9%), 9 (2.3%), and 7 (1.8%) cases, respectively. Few reports on the epidemiology of meningococcal disease in India indicate low incidence of endemic meningococcal disease in India except for occasional epidemics in cities of North India. There is a need of surveillance regarding isolates in acute bacterial meningitis. Such studies should be carried out on a regular basis in a tertiary care hospital where a good laboratory support is available. This will show the trend over the years and will give a picture of the causative organisms for acute bacterial meningitis from time to time.

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HEPATITIS B IN EUROPE

Introduction

Hepatitis is a general term used to describe inflammation of the liver. Liver inflammation can be caused by several viruses (viral hepatitis), chemicals, drugs, alcohol, certain genetic disorders or by an overactive immune system that mistakenly attacks the liver, called autoimmune hepatitis. Depending on its course, hepatitis can be acute, which flares up suddenly and then goes away, or chronic, which is a long-term condition usually producing more subtle symptoms and progressive liver damage [1].

There are five viruses that cause the different forms of viral hepatitis: hepatitis A, B, C, D and E. Hepatitis A is mostly a food-borne illness and can be spread through contaminated water and unwashed food. It is the easiest to transmit, especially in children, but is also the least likely to damage the liver and is usually mild and is completely resolved within six months. Hepatitis

B can be transmitted through exposure to contaminated blood, needles, syringes or bodily fluids and from mother to baby. It is a chronic disorder and, in some cases, may lead to long-term liver damage, liver cancer and cirrhosis of the liver after many years of carrying the virus. Hepatitis C is only transmitted through infected blood or from mother to newborn during childbirth [2].

It too can lead to liver cancer and cirrhosis in the long term. Hepatitis D is only found in people who are also infected with hepatitis B. Hepatitis E is predominantly found in Africa,