MEDICINE

HEARING LOSS AS A COMPLICATION OF BACTERIAL MENINGITIS IN GHANAIAN CHILDREN, KUMASI, GHANA

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ABSTRACT

A retrospective analysis of 105 cases of meningitis admitted at the Paediatric Department of Komfo Anokye Teaching Hospital, Kumasi between January 1987 and February 1988 is presented. The laboratory investigations show that 14 (13.3%) had clear CSF with negative culture. The biochemistry, cell count and type of cells were suggestive of viral meningitis. The remaining 91 (86.7%) cases had turbid CSF suggestive of bacterial infection.

Hearing loss was found in 6.6% of children with bacterial meningitis.

Key Words: bacterial meningitis, hearing loss, cerebrospinal fluid (CSF).

INTRODUCTION

Acute bacterial meningitis is a potential fatal and serious disease in Africa. It has been documented by several authors including Brown[1], Whittle and Greenwood[2], Owusu et al[3] and Chew[4].

Hearing loss is a common serious complication of bacterial meningitis in infants and children. Dodge et al[5] found a prevalence of 5 - 30% in their studies. Brobby[6] in his work on causes of congenital and acquired hearing loss in Ghanaian children attributed 8.5% hearing loss to meningitis. Onofre Munoz et al[7] believe 10% of children who suffer from purulent meningitis will develop some degree of hearing impairment, and that 5% - 20% of deaf children of school-going age had meningitis before the age of two years. This paper analyses the aetiology and sequalae of Hearing loss especially due to bacterial meningitis.

METHOD OF STUDY

From January 1987 to February 1988, 105 patients between the ages of 2 months and 14 years (mean age 60 months) with diagnosis of meningitis were reviewed. Diagnosis was made clinically and confirmed by biochemical and bacteriological examinations of the cerebrospinal fluid. Viral studies and counter immunoelectrophorsis were not available. Therapy was started with chloramphenicol, and ampicillin or penicillin according to relative sensitivities. Simple test like non-response to spoken word or non-response to a bell was used to examine the patients and those who showed no response were sent to the Ear, Nose and Throat Specialist where detailed audiological examinations were conducted. From hospital records the age, sex, onset of the infection before admission and any residual damage to the nervous system especially Hearing loss were recorded.

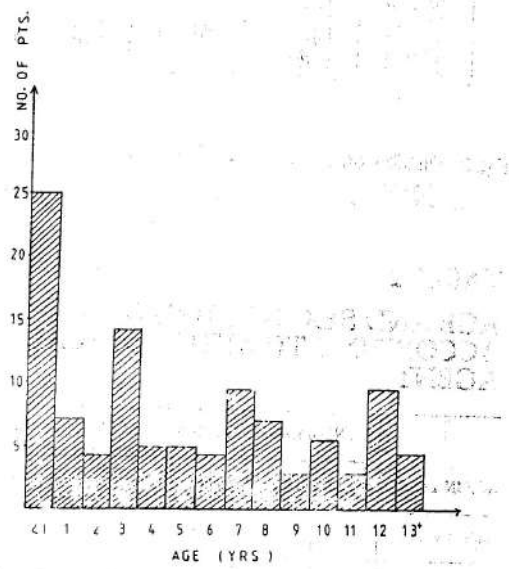

Fig. 1: Age Distribution Patterns

RESULTS

During this period, January 1987 to February 1988, 7686 patients, (excluding neonates) were admitted to the paediatric unit of Komfo Anokye Teaching Hospital. Of these 105 were diagnosed as having meningitis.

In 91 (86.7%) cases out of 105, the CSF was found to be turbid. The remaining 14 (13.3%) had clear fluids. The 14 patients who had clear CSF, had negative culture and biochemistry and cell counts and type were

suggestive of viral meningitis. These were not included in the study. Of the 91 turbid specimens 31 (34.1%) had positive bacterial cultures. 16 (17.6%) out of the 91 turbid cases and 15 (16.6%) of the same number proved to have Neisseria meningitidis and streptococcus pneumoniae respectively. The culture was negative in 60 (65.9%) with turbid CSF specimens.

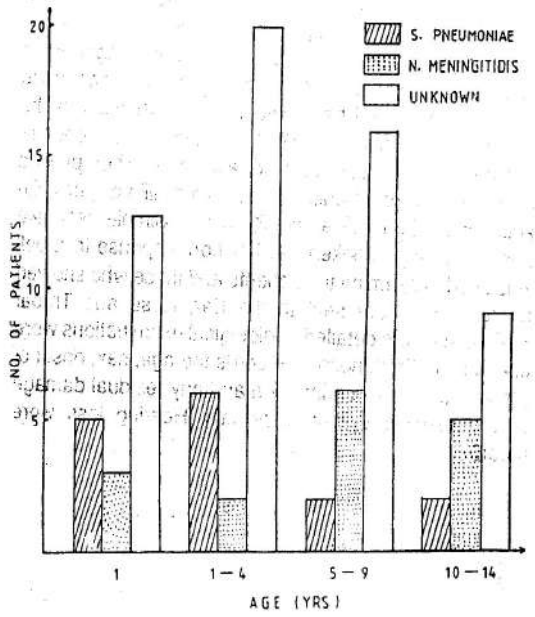

Fig. 2: Distribution of Patients with respect to Actiological Agent

TABLE 2

AGE AND SEX DISTRIBUTION ACCORDING TO AETIOLOGICAL AGENT

	S. PNEUMONIAE		N. MENINGITIDIS		UNKNOWN	
AGE IN YEARS	male(m)	female(f)	male	female	male	female
Under 1 year	1	4	1	2	7	8
1 - 4	2	4	-	2	9	11
5 - 9	2	-	4	2	9	7
10 - 14	2	-	3	2	7	2
SUB TOTAL	7	8	8	8	32	28
TOTAL M+F	15		16		60	

In this study both Neisseria meningitidis and S. pneumoniae were identified as causative organisms. Haemophilus influenzae as causative agent for meningitis was not seen in our study. As table 2 indicates, of the 91 cases with turbid CSF there appeared to be no discrimination of sexes particularly under 1 year (excluding neonates); the ratio of approximately 1:1 was obtained. However, the ratio male - to - female was 3:1 in the age group 10 - 14.

DISCUSSIONS.

Rosenhall et al[8] described two groups of Hearing loss namely:

1. a fluctuant Hearing loss
2. a "delayed temporary" Hearing loss

The first group (fluctuant Hearing loss) consists of patients with manifest hearing loss directly after the disease. In these patients hearing loss fluctuates in one or both ears. (The degree of Hearing loss changes, varying between partial and total Hearing loss). Such patients never recover fully if the hearing loss is bilateral; the prognosis is poor.

In the second group with delayed hearing loss, hearing is normal during or immediately after the disease. At times after a free interval of 6 to 12 months, hearing at both ears begin to deteriorate. This group has better prognosis. They may regain hearing acuity. Keane et al[9] in their review of histopathology responsible for meningitis hearing loss observed:

(a) spread of infection directly to the inner ear, causing purulent labyrinthitis
(b) toxic irritation of the inner ear causing serous labyrinthitis
(c) other factors such as septic emboli causing damage to the vessels to the inner ear and
(d) meningeal irritation resulting in neuritis of the eighth nerve.

Delayed hearing loss has been blamed on toxic labyrinthitis or neuritis of the eighth nerve; the cause of fluctuant Hearing loss is still obscure. From this study six (6.6%) had Hearing loss; which correlates to that of Dodge et al[5] who gave a percentage between 5-30%. The causative agents in this study were predominantly steptococcus pneumoniae and N. meningitidis. Of these six cases, 3 (50%) had steptococcus pneumoniae meningitis. This tallies with the finding of Ozdamar et al[10] who gave 4 out of 7 cases i.e. 57% of sensorineural hearing loss resulting from S. pneumoniae meningitis. Two (33.3%) had Neisseria meningitidis. One (16.6%) of unknown origin. Even though other authors Munoz et al[7], Richner et al[11] and Dodge et al[5] have described Haemophilus influenzae as common cause of sensorineural Hearing loss secondary to meningitis in children. This study does not confirm their observation. Among other reasons for high negative cultures on turbid CSF are self medication by patients (through their

parents); the fact that the sale of antibiotics in Ghana is unrestricted; and that some doctors tend to prescribe broad spectrum antibiotics for infections of unexplained origin. It is interesting to note that Brobby et al[12] in their work on otitis media in Kumasi did not as well find any Haemophilus influenzae as a causative agent.

CONCLUSION

There is a significant correlation between meningitis in childhood and hearing loss. Since hearing loss impairs their further development, speech, play, education and social relation, mothers or parents should be advised to report with sick children particularly when they present such symptoms as malaise, fever, headache, vomiting which frequently are antecedents of meningitis.

The startling figure of about 66 cases of hearing loss following bacterial meningitis in any given 1000 patients calls for greater alertness on the part of the paediatrician and Ear, Nose and Throat Specialist in screening and subsequent follow up.

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