

The effect of the seasonal cerebro-spinal meningitis on the incidence of hydrocephalus in Sudanese children

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Abstract

The inflammatory process of meningitis may obstruct the circulation of cerebrospinal fluid culminating into increased intracranial tension and in children before closure of their frontanel may lead to hydrocephalus. This study was constructed to find out the impact of the out break of meningococcal meningitis into the frequency of hydrocephalus in young children. We found that the peak of the incidence of acquired hydrocephalus in young children follows that of the seasonal cerebro-spinal meningitis (CSM) by few weeks.

The age group affected by post- meningetic hydrocephalus was that below two years. Children of this age group were not included in the national vaccination program against cerebro-spinal meningitis at the time of the study, which may be the cause of their high susceptibility.

Key words: Hydrocephalus, Meningococcal meningitis.



Introduction:

Hydrocephalus in children continues to be a problem since the beginning of time. Its treatment is a real challenge to doctors from the time of ancient Greece. Only after the advent of sophisticated shunt systems in the second half of the past century has the temporal treatment become satisfactory. As the problem is a common one the search for a better understanding to it still continues. In Sudan hydrocephalus is commoner than in the temperate areas and during the hot season meningitis becomes an epidemic. This study is trying to establish the relationship between the seasonal meningitis and hydrocephalus.

- 1- To determine the number of children affected by post-meningetic hydrocephalus.
- 2- To find out the time of onset of hydrocephalus and to relate it to the annual CSM epidemic.

Patients and Methods:

Children affected by acquired hydrocephalus that were referred to Khartoum Teaching Hospital, Soba University Hospital and El Shaab Teaching Hospital in 1993 and 1994 were included in this study.

The time of onset of hydrocephalus was plotted against the seasonal cerebro-spinal meningitis (CSM) epidemic. The patients were distributed according to their age groups.

Results:

A total of 81 children were found to have acquired hydrocephalus.

Three of them were due to tumours and the remaining 78 were post- meningetic (Table 1). Nine of the later group developed meningitis due to infection of meningomyelocoele.

Table (1): Causes of Acquired hydrocephalus.

Cause	Cerebro-spinal meningitis	Tumour	Total
Number of cases	78 (96.3%)	3 (3.7%)	81 (100%)

69 cases had meningitis during the seasonal CSM epidemic. Fig (1) and Fig (2) show that the peak incidence of hydrocephalus follows that of CSM epidemic in the years 1993 and 1994. Table (2) shows the main age group affected by hydrocephalus is below two years and form 90% of the patient population in this study.

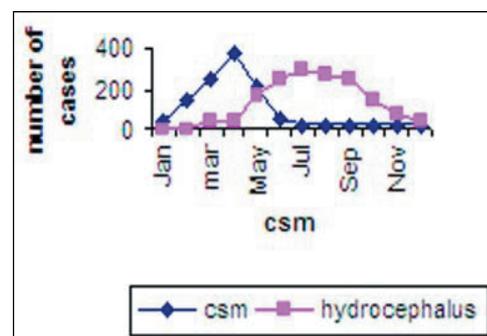


Fig 1. monthly incidence of csm and hydrocephalus in 1993.

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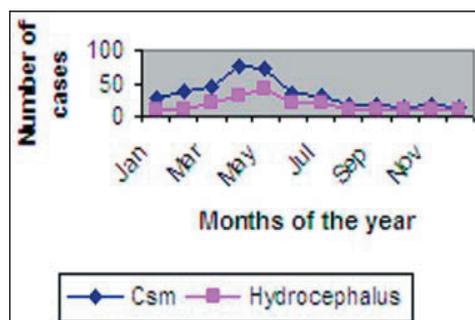


Fig 2. monthly incidence of csm and hydrocephalus in 1994

Discussion:

Post-meningitic hydrocephalus occurs because the inflammatory process destroys the surface through which the cerebro-spinal fluid is absorbed¹. In fig (1) the peak incidence of CSM occurred in April and the peak of hydrocephalus occurred in July 1993. In fig (2) the peak occurs in April 1994 for the former and May for the later. This shows that the maximum incidence of post-meningitic hydrocephalus occurs few weeks after the maximum incidence of CSM epidemic. This agrees with other studies² in which the peak of the incidence of post-meningitic hydrocephalus follows that of CSM epidemic. The same workers also found that the main cause of acquired hydrocephalus was CSM. In another study on hydrocephalus in Sudanese children the peaks of acquired hydrocephalus and CSM coincide³ instead of one following the other. This confirms that the CSM affecting these children is due to the epidemic and not sporadic occurrence. In table (2) more than 90% of the cases of hydrocephalus were below two years. Young children at and below this age group were not included in the vaccination program against CSM at the time of this study, which explains why the majority of the cases were in this age group. Fortunately, the new vaccination program includes children from three months of age⁴. This hopefully will reduce the number of children affected by post-meningitic hydrocephalus in the future.

Conclusion:

As the treatment and care of hydrocephalic children are expensive and not satisfactory, more effort should be directed at prevention of CSM. The main cause of acquired hydrocephalus in this study is meningitis, which occurs during the seasonal epidemic. Control of the epidemic will probably lead to a drop in the number of hydrocephalic children. Probably the savings gained by the drop in the cost of treatment of hydrocephalus will be more than the expenses of the CSM control.

Age in months	Number of cases
0-1	25(30.9%)
>1 - 3	26(32.1%)
>3 - 6	15(18.5%)
>6- 12	5 (6.2%)
>12 - 24	2 (2.5%)
> 24	8(9.9%)
Total	81(100%)

Table (2) Distribution of cases of acquired hydrocephalus according to age

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