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Original Research Paper

Neurology

ANALYSIS OF CSF PLEOCYTOSIS IN A TERTIARY CARE HOSPITAL

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ABSTRACT

BACKGROUND: Cerebrospinal fluid is an important fluid for forming a diagnosis in a considerable amount of patients admitted under internal medicine and neurology. We aimed to study the pattern of CSF Cell Analysis at our Tertiary care Hospital.

MATERIALS AND METHODS: This study spanning over a period of one year was conducted in a tertiary care hospital, evaluating the findings in cerebrospinal fluid from both adult and paediatric in-patients.

RESULTS: A total of 260 samples including 108 adults and 152 paediatric cases were studied. Normal cell counts were observed in 168 cases and pleocytosis in the remaining. One case of epithelial malignancy metastasizing to CNS was also identified. A traumatic tap was observed in two patients. Differential counts showed the predominance of lymphocytes at lower cell counts (< 100 cells/micl) and a predominance of Neutrophils at higher cell counts (> 100 cells/ micl).

CONCLUSION: CSF Cell Analysis is a common investigation done in neurology in-patients, both adults and children. A significant proportion of cases have normal cell counts which is often clinically relevant. The type of cells, although depends mainly on the clinical scenario, seems to vary with total cell count also, with lymphocytes predominating at lower and neutrophils at higher total counts. Monocytes were detected at intermediate cell counts only.

KEYWORDS : Cerebrospinal fluid, pleocytosis, meningitis.

INTRODUCTION

Analysis of cerebrospinal fluid (CSF) forms a key investigation in many a patients admitted in the neurology ward.[1] Despite the advances in diagnostic modalities, simple CSF examination remains a valuable test for the diagnosis of various infective and inflammatory pathologies of CNS. It is a rapid and sensitive method besides being cost-effective which is an important parameter for any diagnostic modality in our part of the world.[2] Various tests carried out on CSF include physical examination for colour, turbidity, biochemical analysis for protein, sugar, microbiological analysis for bacteria, viruses, etc.[3]

AIM:

We aimed to study the pattern of CSF Cell Analysis over a period of one year in Tertiary care Hospital.

MATERIALS AND METHODS:

Samples of CSF received over a period of one year from March 2018 to February 2019 were analysed. All samples were of ante-mortem cases. The hospital register was used to record details of patients. All samples were observed by light microscopy. Total leucocyte count (TLC) and differential leucocyte count (DLC) was done.

RESULTS:

A total of 260 samples were received during a period of one year. Out of these 108 cases were those of adults and 152 were pediatric cases. 54 out of 108 adult samples belonged to male patients and 54 to females.(Table 1) No cells were present in 107 samples, out of which 56 were pediatric and 47 adults. 61 samples had a lymphocyte count of <= 5cells /ul. Out of these 32 samples were pediatric and 29 those of adults. 80 adult samples and 115 pediatric samples revealed CSF pleocytosis, amounting to a total of 195 samples with pleocytosis. 60 pediatric and 28 adult samples had a count between 6 and 100 cells/ul, making a total of 79 cases. A total of 8 cases had counts ranging in between 101 to 1000/ul out of which 4 were pediatric and 4 adults. Two pediatric cases were received with very high counts, one having 4000 cells/ul and another 4057 cells/ul.(Table 2) Two pediatric cases had a traumatic tap. 64 cases had predominant lymphocytosis. 2 pediatric cases had 100% neutrophils on differential count. One patient that was a known case of carcinoma stomach had metastatic deposits of epithelial cells in the CSF.(Figure 1). On studying the differential count it was observed that the lymphocytes predominated at lower cell counts (96% for cell count <5/micl and 77% for cell counts 6 -100/micl). While as neutrophils predominated only at very high cell counts (100% for cell counts > 1000/micl). Monocytes were not seen at very low (< 5/micl) or at higher cell counts (>100/ micl).

Table 1. Age wise distribution of cases:

Age group	No. of cases
Pediatric	152
Adult	108
Total	260

Table 2. Cellularity of cases:

No. of cells per ul	No. of cases
0	107
<=5	61
6-100	79
101-1000	8
>1000	2
Traumatic tap	2
Metastatic deposits	1
Total	260

Table 3. Differential cell analysis:

Cells/ micl range	No. of cases	Purely lympho cytes	Purely neutrop hils	Lymphoc yte predomin ant (> 60 %)	Neutrop hil predomi nant (>60%)	Lymp hocyt es= neutr ophils	Mono c-ytes (in Additi on)
0 - 5	168	161	3	2	0	2	0
6 - 100	79	32	0	29	17	1	7

100 - 1000	8	1	0	5	2	0	0
>1000	2	0	1	0	1	0	0

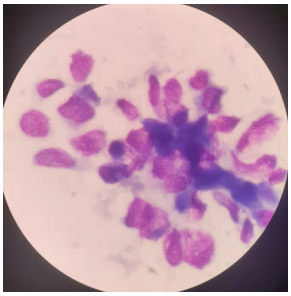

Figure 1: CSF Microscopic picture showing metastasis of an epithelial malignancy.

DISCUSSION:

CSF examination forms the cornerstone in the diagnosis of many neurological disorders.[4] Many previously done studies have elaborated the need of CSF examination.[5] Most common cause of abnormal CSF findings in most studies was meningitis followed by demyelinating diseases and malignancy. Many of the cases received in our laboratory were also for the establishment of meningitis and some for establishment of CNS spread of malignancy. Certain studies have shown that infants and elderly present with non-specific symptoms while as older children and adults present with more specific signs of meningeal irritation. There are many studies which have shown that neonates and infants with culture proven meningitis have normal cell counts on CSF smear examination. This holds relevance for us as well since more than half of the paediatric cases presented with normal cell counts. Various studies have shown cell differentials ranging from predominant lymphocytosis to a neutrophilic pleocytosis.[6,7,8,9,10]

There are certain studies which have emphasized CSF examination in children who had received treatment for acute leukaemia and were presently asymptomatic.[11] Though we received only suspected cases of relapse, however the importance of screening cannot be undermined.

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