ORIGINAL ARTICLE

Tuberculous Meningitis at the Department of Childhealth Dr Pirngadi Hospital Medan (1979)

by

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Abstract

A retrospective study on tuberculous meningitis had been carried out on 43 patients at the Department of Child Health, Dr. Pirngadi Hospital Medan during the year 1979. The peak incidence (55,81%) was found in the age group of less than 3 years of which 55,81% was in the second and 44,18% in the third stadium of the disease. Two of the cases were 4 months of age and 1 case was 14 years. None of the cases had got BCG immunization. Mortality rate was 37,21% of which 25% was in the second and 52.63% in the third stadium. Cerebrospinal fluid examination showed that 46.50% had cell counts between 101 – 500 cells/mm3. The symptoms were prolonged fever (62.79%), convulsions (72,09%) and unconciousness (27,90%).

Of these cases 83,72% had contact with tuberculous patients; 6,9% had positive tuberculin test and 48,83% showed pulmonary involvement on radiological examination. Nutritional status of these cases showed that 48,83% were undernourished and 34,82% were in poor nutritional status.

Introduction

Tuberculous (TB) meningitis is a condition of inflammation of meningitis as a result of hematologic spreading of primary tuberculosis to the CNS, causing subacute meningoencephalitis; prognosis is poor (Nelson et. al., 1979; Farmer, 1975).

Primary focus is usually in the lung, eventhough in other organs may also be found for example lymphnodes, bones, nasal sinuses, digestive tract and other organs (Nelson et al., 1979).

In Indonesia the incidence of TB meningitis is high because the morbidity of tuberculosis is still high. Most of these cases are infants and younger children where the body resistance is still low.

Though treatment gives very good results, mortality rate is still high and if the patients recovered they mostly become invalids (Nelson et al., 1979; Farmer, 1975). Tjaij et al. (1975) in Medan, and Rahajoe et al. (1979) in Jakarta found mortality rate of 47.8% and 35% respectively.

At the Department of Child Health Dr. Pirngadi Hospital Medan all patients with serous meningitis are treated as TB meningitis. This is due to the high prevalence of serous meningitis in Indonesia while virologic diagnostic could not be done yet in Medan.

The purpose of this study is to find out the morbidity and mortality of TB meningitis at the Department of Child Health Dr. Pirngadi Hospital Medan in the year 1979.

Material and methods

This study is a retrospective study during 1979 at the Department of Child Health Dr. Pirngadi Hospital Medan. Diagnosis was done by clinical and laboratory data without bacteriological examination.

Course of TB was divided in 3 stadia

I. Mild fever of long duration, vomiting, headache, abnormal findings of cerebrospinal fluid (CSF) like increased number of cells with prevailing mononuclear cells and positive Nonne and Pandy tests.

II. Mild fever with neurologic signs for example convulsion, meningeal sign, paralysis or paresis, with abnormal findings in CSF like stadium I.

III. Sopor until coma with abnormal findings of CSF like in stadium I and the condition similar to stadium II.

Nutritional status was defined according to Gomes criteria (1975).

I. Mild malnutrition : BW is 76 – 85% of normal BW.

II Moderate malnutrition: BW is 61 – 75% of normal BW.

III. Severe malnutrition : BW is less than 60% of normal BW.

Result

During 1979 there were 43 (1,4%) cases of serous meningitis out of 2928 cases admitted to the Department of Child Health, Dr. Pirngadi Hospital, Medan.

Table 1 shows the age and sex distribution according to age.

TABLE 1 : *Distribution according to age and sex.*

No.	Age/years	Male	Female	Total	%
1.	0 – 3	9	15	24	55,81
2.	3 – 6	5	3	8	18,61
3.	6 – 9	5	2	7	16,28
4.	Over 9	2	2	4	9,30
	Total	21*	22*	43	

* p. > 0,05

There were 24 cases (55,81%) in the age group of 0 – 3 years and 4 cases (9,30%) in the age group of over 9 years. There were no significant differences between the age groups. There were also no significant differences between males and females (p> 0.05).

Table 2 reveals the distribution of age and stadium of the disease.

TABLE 2 : *Distribution of age and stadium of the disease.*

Age / years	No of case	%	Stadium		
			I	II	III
0 – 3	24	55,81	–	15	9
3 – 6	8	18,61	–	5	3
6 – 9	7	16,28	–	2	5
Over 9	4	9,30	–	2	2
Total	43	100	–	24* (55,81%)	19* (44,18%)

* p > 0.05

In this study all of the cases were at a later stadium namely :
Stadium II 55,81% and stadium III 44,18%

Table 3 shows the mortality rate of the cases.

There were no significant differences between cases in stadium II and stadium III ($p > 05$).

TABLE 3 : *Distribution of mortality rate and stadium of the disease*

Age/years	No of cases	Mortality			Total	%
		S I	S II	S III		
0 – 3	24	–	2	4	6	13,93
3 – 6	8	–	2	2	4	9,30
6 – 9	7	–	2	3	5	11,63
Over 9	4	–	–	1	1	2,33
Total	42	–	6*	10*	16	37,21

* $p > 0.05$ S = Stadium

Sixteen cases (37,21%) in this study died. High mortality rate was found in the age group of 0 – 3 years, the lowest mortality rate was in the age group of 9 years and above (2,33%). Mortality rate in stadium II was 25% and stadium III 52,63%.

There were no significant differences between mortality rate in stadium II and stadium III ($p > 0.05$).

Table 4 reveals the clinical findings of the patients in this study.

TABLE 4 : *Clinical findings*

Complaints	no of cases	%
Convulsion	31	72,09
Fever > 7 days	27	62,79
Decreased sensorium	12	27,90
Fever < 7 days	9	20,93
Cough	7	16,27
Diarrhea	6	13,95
Vomiting	5	11,62
Paralysis	4	9,30
Neckstiffness	3	6,79
Dyspnea	2	4,65
Headache	1	2,33

Mild fever for more than 7 days was found in 27 cases, high fever lasting less than 7 days was found in 9 cases. Thirty one cases were found with convulsion and 12 cases with decreased sensorium.

The features of cerebrospinal fluid can be seen in Table 5.

TABLE 5 : *Features of cerebrospinal fluid*

Cell (cmm)	No of cases	%
10 – 100	10	23,25
101 – 500	20	46,50
501 – 1000	7	16,27
> 1001	3	13,95

In most of the cases (46,50%) we found 101 – 500 cells/cmm, white cell count above 1001/cmm found in 3 cases (13,95%).

Table 6 shows the distribution of polymorphonuclear cells (PMNC) and mononuclear cells (MNC) in the cerebrospinal fluid.

TABLE 6 : *Distribution of polymorphonuclear cells (PMNC) and mononuclear cells (MNC) in cerebrospinal fluid.*

Cell percentage	PMNC	MNC
0 – 25%	29 cases	–
25 – 50%	11 cases	–
51 – 75%	–	14 cases
76 – 100%	–	24 cases

There were 29 (0–25%) cases with PMNC and 24 (76 – 100%) cases with MNC.

Table 7 shows the distribution of the patients who had contact with Koch pulmonum and who had abnormality in the lung and the result of tuberculin test.

TABLE 7 : *Cases who had contact with Koch pulmonum, abnormality in the lung and tuberculin test reaction.*

Items	No.	%
Contact with Koch pulmonum	36	83,72
Abnormality of the lung	21	48,83
Tuberculin test positive	3	6,97

In this study we found that no one had got BCG vaccination before.
Contact with Koch pulmonum was found in 36 cases (83,72%).
X–foto of the lung showed abnormality in 21 cases (48,83%) and positive tuberculin test was in 3 cases (6,97%).

Table 8 reveals the distribution of the patients in connection with the nutritional status.

TABLE 8 : *Nutritional condition of the patients*

Nutritional state	No of cases	%
Mild	7	16,82
Moderate	21	48,83
Severe	15	34,88

Discussion

In this study there were 43 cases with TB meningitis. Most of the cases (55,81%) were in the age group of less than 3 years. Farmer (1975) found that 2/3 of his cases with TB meningitis were in the age group of less than 10 years and the most frequent in the age group of less than one year.
According to Nelson et al., (1979) the age peak incidence was in the age group of less than 2 years. Tjaij et al. (1975) in Medan, found peak incidence in the age group of less than 4 years (72,25%), Visudiphan and Chiemchanya (1979) found most of his cases in the age group of less than 6 years.
Rahajoe (1979) found that 90% of her cases were in the age group of less than 6 years. This may be due to close and frequent contact with adult tuberculous patients and low body resistance.

Table 9 shows the mortality rate according to the findings of some authors.

TABLE 9 : *Mortality rate*

Year	Authors	%
1962	Hokert and Donner (1962)	44,5
1963	Miller (1963).	31
1964 – 1962	Tjaij et al. (1975).	47,8
1979	Rahajoe et al. 1979	35
1979	Sondang Tambunan	37,21

Table 10 shows the mortality rate according to the stadium of the disease.

TABLE 10 : *Mortality rate according to the stadium of the disease*

Authors	Mortality rate (%)		
	S I	S II	S III
Hokert and Donner (1962)	19,5	21,1	68,4
Nelson et al. (1979)	–	15	50
Sondang Tambunan	–	13,95	23,26

S = stadium

The most prominent clinical manifestation in this study was convulsion (72,69%), followed by mild fever lasting of more than 7 days (62,79%) (see table 4).

In this study no one had got BCG vaccination before. Tuberculin test is still an important tool in making the diagnosis of primary tuberculosis in children (Rahajoe et al. 1979; Nelson et al., 1979). In this study 6,97% had positive tuberculin test (table 7).
This low finding may be caused by the severity of the disease itself and also by the late admittance so that the patient was already in an anergic state (Rahajoe et al., 1979). Undernutrition may also be one of the factors that cause the tuberculin test to become negative (table 8).
Harrison et al. (1969) in Nigeria found that most of their cases had negative tuberculin test; he found 67,6% tuberculin negative out of 68 cases.

Many factors may influence tuberculin test like variation and dose of tuberculin, technic of administration, state of the patient and interpretation of induration.

This study may be summarised as follows :

1. All cases come at a late state.
2. Mortality rate was high.
3. Contact with adult tuberculous patients was high.
4. Patients nutritional condition were poor.
5. BCG vaccination rate was very poor.
6. Health education on prevention and management of TB and malnutrition should be more enhanced in the society.

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