



HYDROCEPHALUS AND TUBERCULOUS MENINGITIS

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ABSTRACT

Objectives: Frequency of hydrocephalus development in cases suffering from Tuberculosis meningitis (TBM). **Material and methodology;** In this cross sectional study carried out at Lahore General Hospital, Lahore during November 2017 to May 2018, the cases of both genders and adult range of age i.e. more than 12 years were selected. The diagnosis of TBM was made on the basis of fever, drowsiness, nuchal rigidity and characteristic exudative lymphocytic picture on CSF analysis. The diagnosis of hydrocephalus was made on the basis of CT brain without contrast showing dilated ventricles of more than 50% of the normal for that age. **Results;** In the present study, 100 cases of TBM were selected with mean age of 34.57 ± 9.23 years. There were 62 (62%) males and 58 (58%) had stage II of BMRC scale of TBM. Hydrocephalus was seen in 56 (56%) of the cases. Hydrocephalus was seen more in females affecting 24 (63.15%) of the cases with $p= 0.34$. Hydrocephalus was significantly high in stage III affecting 29 (70.73%) cases as compared to 27 (47.36%) cases in stage II and none of the cases in grade I in their subgroups with $p= 0.01$. **Conclusion;** Hydrocephalus is seen in almost half of the cases suffering from TBM and it is significantly high in stage III of TBM.

KEYWORDS: TBM, CT, Hydrocephalus.

INTRODUCTION

Mycobacterium Tuberculosis (MTB) is an organism of the ancient times and have led to a death of the billion and trillion cases in the past. It is more profound in the under developed countries where poor ventilation and sanitation is found and due to congested places the likelihood to spread infection is more as compared to the developed countries. The incidence of TB irrespective of its site is around 270/100000 population in Pakistan.^[1]

Tuberculosis had the potential to involve any part of the body; though the lung, tonsils, lymph node and skin are the site get infected as primary TB. Then further spread and reactivation over a point of time can involve the other organs of the body as well. Brain and meningeal involvement is not uncommon and is a fatal entity. There are a number of presentation in the central nervous system involvement and include Tuberculoma formation, tuberculous meningitis (TBM), hydrocephalus etc. The diagnosis relied upon cerebro-spinal fluid (CSF) analysis with classical exudative and lymphocytic dominant picture.^[2-3]

TBM is a highly morbid disease and can be categorized on the basis of severity by British Medical Research Council contemporary clinical criteria (BMRC) and it can lead to high degree of morbidity and mortality.

Hydrocephalus is the major complication associated with this and its incidence varies between 20%,^[3] to 65%,^[4] globally. The studies from Pakistan has revealed its incidence in 58% and 60% in studies from Rawalpindi and Karachi respectively.^[5-6] and in a study from India it was observed in 33.3 % of cases only.^[7]

OBJECTIVE

Frequency of hydrocephalus development in cases suffering from Tuberculosis meningitis (TBM).

MATERIALS AND METHODS

Study Design

Cross sectional

Study duration

November 2017 to May 2018.

Study place

Lahore General Hospital, Lahore

Sampling technique

Non probability consecutive sampling

In this study the cases of both genders and adult range of age i.e. more than 12 years were selected. The diagnosis

of TBM was made on the basis of fever, drowsiness, nuchal rigidity and characteristic exudative lymphocytic picture on CSF analysis. These cases were divided into 3 stages of TBM according to standard BMRC staging system. The cases with space occupying lesions in the brain and previous history of hemorrhagic strokes were excluded. The diagnosis of hydrocephalus was made on the basis of CT brain without contrast showing dilated ventricles of more than 50% of the normal for that age.

Statistical Analysis

The data was processed by the use of SPSS-version 23 and post stratification Chi Square test was applied taking P-value < 0.05 as significant.

RESULTS

In the present study, 100 cases of TBM were selected with mean age of 34.57±9.23 years as in table I. There were 62 (62%) males and 58 (58%) had stage II of BMRC scale of TBM. Hydrocephalus was seen in 56 (56%) of the cases. Hydrocephalus was seen more in females affecting 24 (63.15%) of the cases with p= 0.34 as in table II. Hydrocephalus was significantly high in stage III affecting 29 (70.73%) cases as compared to 27 (47.36%) cases in stage II and none of the cases in grade I in their subgroups with p= 0.01 as in table III.

Table I: Study variables.

Variables	Mean ± SD	Range
Age	34.57±9.23	12-78
BMI	27.11±3.27	19-37
Duration of TBM (days)	3.24±0.96	1-7

Table II: Hydrocephalus and gender.

Gender	Hydrocephalus		Total
	Yes	No	
Male	32 (51.61%)	30 (48.39%)	62 (100%)
Female	24 (63.15%)	14 (36.85%)	38 (100%)
Total	56 (56%)	44 (44%)	100 (100%)

p = 0.34

Table III: Hydrocephalus and TMB stage.

Stage of TBM	Hydrocephalus		Total
	Yes	No	
I	00 (00%)	02 (100%)	02 (2%)
II	27 (47.36%)	30 (52.64%)	57 (57%)
III	29 (70.73%)	12 (29.37%)	41 (41%)
Total	56 (56%)	44 (44%)	100 (100%)

p= 0.01

DISCUSSION

Central nervous system infections are always difficult to manage and with high degree of mortality and so is true for TBM as TB is also otherwise difficult to treat due to long course of treatment, compliance issues and the side effect profile associated with this. In Asian countries the mortality rate of TBM is 1.5/100000 population.

Hydrocephalus was seen in 56 (56%) of the 100 subjected included in this study. These results were almost similar to the other studies done in the past in the same country and was seen as 58 and 60% of the cases respectively.^[5-6]

Furthermore, according to studies done by Nabi S et al and Thwaites et al also revealed the frequencies of hydrocephalus around 60% of the cases suffering from TBM.^[9-10] This was in contrast to the study done by Chan et al where dramatically lower results were observed and hydrocephalus was seen in 29% of the cases with TBM only.^[11]

Hydrocephalus was significantly high in stage III affecting 29 (70.73%) cases as compared to 27 (47.36%) cases in stage II and none of the cases in grade I in their subgroups with p= 0.01. This finding was also strengthened by the study done by Chan et al where it was more significantly high seen in cases with stage II and III as compared to one and comprised 89% of the cases having TBM. Salekeen S and Newton RW also revealed the similar types of results and revealed that the higher the severity of the stage of TBM and more likelihood was to developed hydrocephalus with p values of 0.03 and 0.04 respectively.^[12-13]

CONCLUSION

Hydrocephalus is seen in almost half of the cases suffering from TBM and it is significantly high in stage III of TBM.

REFERENCES

1. WHO. Global TB report [internet], 2014. [cited 2015 May 25]. Available from: <http://www.who.int/tb/publications/global-report/en/>.
2. Thwaites GE, Tran TH. Tuberculous meningitis: many questions, too few answers. *Lancet Neurol.*, 2005; 4(3): 160–70.
3. Idris MN, Mirgani SM, Zibair MA, Ibrahim EA, Abadaltif MA, Rida RM, et al. Tuberculous meningitis in HIV negative adult Sudanese patients: clinical presentation and outcome of management. *Sudan Med J.* 2010; 46(3): 121-31.
4. Raut T, Garg RK, Jain A, Verma R, Singh MK, Malhotra HS, et al. Hydrocephalus in tuberculous meningitis: incidence, its predictive factors and impact on the prognosis. *J Infect.* 2013; 66(4): 330-37.
5. Nabi S, Khattak S, Badsha M, Rajput HM. Neuro radiological manifestations of tuberculosis meningitis. *Pak J Neurol Sci.*, 2014; 9(2): 16-21.
6. Sher K, Firdaus S, Abbasi A, Bullo N, Kumar S. Stages of tuberculous meningitis: a clinicoradiologic analysis. *J Coll Physicians Surg Pak.*, 2013; 23(6): 405-8.
7. Alva R, Alva P. A study of CT findings in children with neurotuberculosis. *Int J Biomed Res.* 2014; 5(11): 685-87.

8. Laureys S, Piret S, Ledoux D. Quantifying consciousness. *Lancet Neurol*, 2005; 4(12): 789-90.
9. Thwaites GE, Chau TT, Stepniewska K, Phu NH, Chuong LV, Sinh DX, et al. Diagnosis of adult Tuberculosis meningitis by use of clinical and laboratory features. *Lancet*, 2002; 360: 1287-92.
10. Nabi S, Khattak S, Badsha M, Rajput HM. Neuro radiological manifestations of tuberculosis meningitis. *Pak J Neurol Sci.*, 2014; 9(2): 16-21.
11. CHAN KH, CHEUNG CY, FONG KL, TSANG W, MAK SL. Clinical relevance of hydrocephalus as a presenting feature of tuberculous meningitis. *Q J Med*, 2003; 96: 643–48.
12. Salekeen S, Mahmood K, Naqvi IH, Akhter SH, Abbasi A. Clinical course, complications and predictors of mortality in patients with tuberculous meningitis an experience of fifty two cases at Civil Hospital Karachi, Pakistan. *J Pak Med Assoc*, 2013; 63(5); 563-67.
13. Newton RW. Tuberculosis meningitis. *Arch Dis Child*, 1994; 70: 364–66.