



CODEN [USA]: IAJ PBB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF  
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.1297616>Available online at: <http://www.iajps.com>

Research Article

**HYDROCEPHALUS IN CASES OF TUBERCULOUS  
MENINGITIS****Dr. Ahmed Zaman, Dr. Muhammad Tauqeer Hashim, Dr. Farhad Rasul Mashori  
Sheikh Zayed Hospital, Rahim Yar Khan****Abstract:**

**Objectives:** To determine the frequency of hydrocephalus in cases with tuberculous meningitis. **Material & methods;** this was a cross sectional study which was conducted during January 2017 to June 2017 at Department of Medicine BVH Hospital, Bahawalpur. In this study the cases irrespective of gender with age 12 years or more were included. The diagnosis of TBM was made on cerebrospinal fluid analysis with lymphocyte count of 20 to 500 cells/mm<sup>3</sup> and raised protein with decreased glucose (less than 60% of the blood sugar level). The cases with head injury and those with any malignancy of the brain were excluded. The cases of TBM were stratified on the basis of severity according to BMRC criteria. Hydrocephalus was labelled when any of the ventricle was dilated more than 25% of the normal size. **Results;** In this study, 100 cases of bacterial meningitis were selected, among which 68 (68%) were male and the mean age of the participants was 37.31±9.41 years. Hydrocephalus was seen in 56 (56%) of cases. Hydrocephalus was significantly high in males affecting 41 (60.3%) of cases with  $p=0.02$ . This was also high in cases that had age less than 40 years where it was seen in 44 (61.9%) of cases with  $p=0.01$ . Hydrocephalus was significantly high in cases that had BMRC stage III affecting 22 (64.7%) of cases with  $p=0.03$ . **Conclusion;** Hydrocephalus is seen in more than half cases of TBM and it is significantly high in male gender and those with age less than 40 years and with stage III of TBM.

**Key words:** TBM, BMRC, hydrocephalus.**Corresponding author:****Dr. Muhammad Tauqeer Hashim,**

Sheikh Zayed Hospital,

Rahim Yar Khan

iamtauqeer@yahoo.com

QR code



Please cite this article in press Muhammad Tauqeer Hashim *et al* **Hydrocephalus in Cases of Tuberculous Meningitis**, *Indo Am. J. P. Sci*, 2018; 05(06).

**INTRODUCTION:**

Tuberculosis (TB) is among the high burden infectious diseases and is present from the ancient times and Pakistan has an incidence rate of 275/100000 population according to a World health organization survey [1]. It can virtually affect any organ of the body and is a great mimicker of a number of disease and that's why this lead to a diagnostic delay and more diverse clinical and complication array. Tuberculosis meningitis (TBM) is one of fata complications and can result in different complications in the form of neck stiffness, Tuberculoma, abscess sin the brain and hydrocephalus. Diagnosis is usually clinical and a particular cerebrospinal fluid (CSF) picture; as culture is usually negative for MTB [2].

The prevalence of hydrocephalus is widely variable in TBM and varies from 20% [3] to 65% [4] in countries where TB prevalence is high. In a study conducted in Pakistan on 100 cases of TBM, 58% of the cases had hydrocephalus [5]. While in another study this was observed in 60% of cases. Moreover, in a study from India on 45 cases of TBM revealed hydrocephalus in 33.3 % of cases only [6,7].

**MATERIAL AND METHODS:**

This was a cross sectional study which was conducted during January 2017 to June 2017 at Department of Medicine BVH Hospital, Bahawalpur. In this study the cases irrespective of gender with age

12 years or more were included. The diagnosis of TBM was made on cerebrospinal fluid analysis with lymphocyte count of 20 to 500 cells/mm<sup>3</sup> and raised protein with decreased glucose (less than 60% of the blood sugar level). The cases with head injury and those with any malignancy of the brain were excluded. The cases of TBM were stratified on the basis of severity according to BMRC criteria. Hydrocephalus was labelled when any of the ventricle was dilated more than 25% of the normal size.

**Statistical analysis**

The data was entered and analyzed with the help of SPSS version 22. Post stratification Chi Square test was applied taking P-value < 0.05 as significant.

**RESULTS:**

In this study, 100 cases of bacterial meningitis were selected, among which 68 (68%) were male and the mean age of the participants was 37.31±9.41 years. Hydrocephalus was seen in 56 (56%) of cases. Hydrocephalus was significantly high in males affecting 41 (60.3%) of cases as in table I with p= 0.02. This was also high in cases that had age less than 40 years where it was seen in 44 (61.9%) of cases with p= 0.01 (table II). Hydrocephalus was significantly high in cases that had BMRC stage III affecting 22 (64.7%) of cases with p= 0.03 as in table III.

**Table I: Hydrocephalus vs gender**

Gender	Hydrocephalus		Total	p value
	Yes	No		
Male	41 (60.3%)	27 (39.7%)	68 (100%)	0.02
Female	15 (46.9%)	17 (53.1%)	32 (100%)	
<b>Total</b>	<b>56 (56%)</b>	<b>44 (44%)</b>	<b>100 (100%)</b>	

**Table II: Hydrocephalus vs groups of ages**

Age groups	Hydrocephalus		Total	p value
	Yes	No		
<40	44 (61.9%)	27 (38.1%)	71 (100%)	0.01
>40	12 (41.4%)	17 (58.6%)	29 (100%)	
<b>Total</b>	<b>56 (56%)</b>	<b>44 (44%)</b>	<b>100 (100%)</b>	

**Table III: Hydrocephalus vs BMRC stage**

BMRC stage	Hydrocephalus		Total	p value
	Yes	No		
<b>II</b>	34 (51.5%)	32 (48.5%)	66 (100%)	0.03
<b>III</b>	22 (64.7%)	12 (35.3%)	34 (100%)	
<b>Total</b>	<b>56 (56%)</b>	<b>44 (44%)</b>	<b>100 (100%)</b>	

**DISCUSSION:**

Tuberculosis meningitis (TBM) is a life threatening complication observed in cases with extra pulmonary TB and can lead to wide range of neurological impact and out of these hydrocephalus is a salient one. Squeal. Hydrocephalus was seen in 56 (56%) of cases suffering from TBM. This finding was consistent with the studies done by Nabi S et al and Thwaites GE et al, where they found this complication ins 57% and 61% of cases respectively [9,10]. However this was in contrast to a Chinese study where this was seen in only 29% of the cases [11].

Hydrocephalus was significantly high in males affecting 41 (60.3%) of cases as in table 01 with  $p=0.02$ . Kumar R and Christensen AS et al, also found that the males are more prone to affect form this complication but the finding of their study did not find any significant association [12,13]. Another finding of their study was that the males also suffered from TBM more as compared to females where 72 out of 104 cases were males and in the present study 68 out of 100 cases were males; hence showing male dominance of this disease. Hydrocephalus was also high in cases that had age less than 40 years where it was seen in 44 (61.9%) of cases with  $p=0.01$ . The data from the previous studies have also shown that the younger population is more vulnerable to develop hydrocephalus and in majority of the studies this was found to be in the age range of 25 to 40 years [14-16].

Hydrocephalus was significantly high in cases that had BMRC stage III affecting 22 (64.7%) of cases with  $p=0.03$ . Chan et al also found this maximum in cases having stage II and III affecting 89% and those with stage I had this in 11% of cases only. Similar trends were seen by Salekeen S and Newton RW and explain the factor that higher the severity of the disease and higher are the chances to developed hydrocephalus.

**CONCLUSION:**

Hydrocephalus is seen in more than half cases of TBM and it is significantly high in male gender and those with age less than 40 years and with 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.
9. Nabi S, Khattak S, Badsha M, Rajput HM. Neuro radiological manifestations of tuberculosis meningitis. *Pak J Neurol Sci*. 2014;9(2):16-21.
  10. 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.
  11. Kumar R, Singh SN, Kohli N. A diagnostic rule for Tuberculosis meningitis. *Arch Dis Child*.1999;81:221–24.
  12. Christensen AS, Andersen AB, Thomsen VO, Andersen PH, Johansen IS. Tuberculosis meningitis in Denmark: a review of 50 cases. *BMC Infect Dis*. 2011; 11:47.
  13. Hoşoğlu S, Geyik MF, Balik I, Aygen B, Erol S, Aygencel SG et al. Tuberculous meningitis in adult in Turkey: epidemiology, diagnosis clinic and laboratory. *Eur J Epidemiol* 2003; 18: 337–43. 13.
  14. Anderson NE, Somaratne J, Mason DF, Holland D, Thomas MG. A review of tuberculous meningitis at Auckland City Hospital, New Zealand. 2010; 17: 1018–22. 14.
  15. Molavi A, Le Frock JL. Tuberculous meningitis. *Med Clin North Am* 1985; 69: 315–31.
  16. 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.
  17. Newton RW. Tuberculosis meningitis. *Arch Dis Child*. 1994; 70:364–66.