

**CLINICAL PROFILE OF TUBERCULOUS MENINGITIS PATIENTS PRESENTING TO
A TERTIARY CARE CENTRE: A CROSS SECTIONAL OBSERVATIONAL STUDY**Shabeer Ahmad Paul¹, Shagufta Yousuf² and Showkat Hussain Tali*³¹Registrar Internal Medicine, AFHSR, Saudi Arabia.²Assistant Professor OBG, AIMS Bathinda, Punjab, India.³Assistant Professor Pediatrics, AIMS Bathinda, Punjab, India.***Corresponding Author: Dr. Showkat Hussain Tali**

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Article Received on 01/06/2017

Article Revised on 22/06/2017

Article Accepted on 13/07/2017

ABSTRACT

Background: Failure to recognize tuberculous meningitis in time and not to start treatment early results in high morbidity and mortality. Understanding the clinical presentation in a certain population is essential for planning best possible patient care. **Aim:** To understand the clinical profile of the patients of tuberculous meningitis for the better patient care. **Methods:** Sixty nine patients were enrolled for the study. History, clinical examination, CSF examination and ophthalmological examination were carried out and recorded in a predesigned proforma. **Results:** Majority of the registered patients (71%) was in the age group of 15 to 45 years and presented with acute symptoms of less than 2 weeks of duration (42%). Incidence of tuberculous meningitis was similar in males and females (53.6% v/s 46.4%). Only one third of the patients presented with definitive diagnoses and more than a third (39.1%) were having severe disease at presentation. Headache, fever and vomiting were the most common symptoms at presentation while as the most common clinical sign was nuchal rigidity. Most common motor deficit was paraparesis and the cranial nerve most commonly involved was cranial nerve VI. **Conclusion:** Most of the patient with tubercular meningitis present acutely. Headache and fever being most common symptoms while as nuchal rigidity, paraparesis and involvement of the cranial nerve VI being the most common neurological signs at the time of presentation.

KEYWORDS: Tuberculous Meningitis, Clinical Profile, Cerebrospinal Fluid.**INTRODUCTION**

Tuberculosis continues to be an important public health problem in South East Asia, despite improvement in living standards brought about by rapid economic growth over the past couple of decades. Central nervous system involvement by the disease is estimated to occur in 5-10% of patients with tubercular meningitis as the most common manifestation.^[1] The disease may present acutely with altered sensorium and neck rigidity or much more commonly with malaise, headache and minimal mental changes. For that reason, in many patients, it is difficult to recognize the condition and a high index of suspicion is necessary to establish the diagnosis. Failure to recognize and start early treatment results in high morbidity and mortality. The data on tuberculous meningitis in Kashmir is very limited. Understanding the clinical presentation in a certain population is essential for planning best possible patient care. This study was designed to look for the clinical profile of tuberculous meningitis in Kashmir in order to understand the disease better to provide the timely and appropriate care to the patients.

MATERIAL AND METHODS

This cross sectional observational study was conducted in the post graduate Department of Medicine, Sher-i-Kashmir Institute of Medical Sciences, Kashmir, India. Cases admitted through Neurology OPD or Accident and Emergency Department from July 2008 to September 2010 with a provisional diagnosis of meningitis were enrolled. **Inclusion Criteria:** (A) Fever, headache, vomiting, altered sensorium, focal deficit of any duration. (B) CSF showing Pleocytosis {> 20 cells predominantly lymphocytes (> 60%)}, Protein > 100 mg%, Sugar < 60% of corresponding blood sugar. (C) Radiologically, CT or MRI brain showing 2 or more of following: (1) Exudates in basal cistern or sylvian fissure; (2) Hydrocephalus; (3) Infarcts; (4) Basal exudates. (D) Extranural TB as evidenced by radiological or microbiological or histopathology.

Exclusion Criteria: Age < 15 yrs, Post-traumatic meningitis, cases showing spontaneous improvement without specific antimicrobial therapy, CSF staining or culture reveals pyogenic organisms, positive CSF Indian Ink Staining or positive fungal growth in CSF culture. The cases were categorized as follows: 1. Definitive: A +

bacterial isolation (Mycobacterium) from CSF by staining, culture or PCR. 2. Highly probable: A,B,C and D. 3. Probable: A + any 2 of B, C, D. 4. Possible: A + any 1 of B, C, and D. A detailed neurological examination with special consideration to GCS, motor deficit and fundus examination was performed. Special investigations which were performed in addition to baseline investigations included: CSF analysis for cells, protein, Sugar; CSF staining (Gram, Acid fast, Indian Ink); CSF for BAT (Brucella Antigen test) to rule out neurobrucellosis; CSF ADA (adenosine deaminase) levels; CSF culture for mycobacterium tuberculosis (MTB) and PCR for MTB DNA; CT or MRI Brain.

Statistical analysis: Frequency distribution of clinical, laboratory and radiological parameters was studied using descriptive analysis. A p value less than 0.05 was taken to be statistically significant. Data were analyzed using SPSS version 20.

OBSERVATIONS AND RESULTS

Demographic parameters of the patients have been shown in table 1 and frequency, duration and severity of

symptoms and diagnostic category at presentation in table 2. Frequency distribution of Motor deficit and Cranial nerve palsy has been depicted in table 3 whereas fundoscopic findings and frequency of hyponatremia in subjects studied has been given in table 4. Frequency distribution of various CSF parameters has been given in table 5 and statistical analysis in table 6.

Table 1 Demography of patients with tuberculous meningitis (n=69)

Attribute		No. / %age
Age (years)	15-30	31 (44.9)
	31-45	18 (26.1)
	46-60	11(15.9)
	>60	9 (13)
Sex	Male	32 (46.4)
	Female	37 (53.6)
Residence	Rural	57 (82.6)
	Urban	12 (17.4)

Table 2 Frequency, duration and severity of symptoms and diagnostic category at presentation in patients with tuberculous meningitis (n=69)

Symptoms	No/%age	Symptom Duration	No/%age
H	1 (1.4)	<14 Days	29 (42)
F	2 (2.9)	14 -28 Days	20 (29)
H,F	5 (7.2)	>28 Days	20 (29)
HV	6 (8.7)	Diagnostic Category	
FA	1 (1.4)	Definitive	23 (33.3)
H,F,V	28 (40.6)	Highly Probable	6 (8.7)
HFA	7 (10.1)	Probable	18 (26.1)
HVA	1(1.4)	Possible	22 (31.9)
FAS	1(1.4)	Stage of TB Meningitis	
HFVA	13 (18.8)	I	(27) 39.1
HFVS	3 (4.3)	II	(26) 37.7
HFAS	1 (1.4)	III	(16) 23.2

H = Headache; F = Fever; V = Vomiting; S = Altered sensorium

DISCUSSION

In our study, a total of 69 cases with a diagnosis of tuberculous meningitis were registered. Incidence in males and females was similar and the population affected was predominantly rural (table 1). Majority of the patients were in the age group of 15 to 45 years (table 1) and presented with acute symptoms of less than 2 weeks of duration (table 2) . Only one third of the patients presented with definitive diagnoses and majority were having severe disease at presentation (table 2). Headache, fever and vomiting were the most common symptoms at presentation while as the most common sign was nuchal rigidity (table 2). Most common motor deficit was paraparesis and the cranial nerve most commonly involved was cranial nerve VI (table 3).

Table 3 Frequency distribution of Motor deficit and Cranial nerve palsy (n=69)

Attribute		No./%age
Motor Deficit	No Deficit	58 (84)
	Monoparesis	3 (4.3)
	Hemiparesis	3 (4.3)
	Paraparesis	5 (7.2)
Cranial nerve palsy	Absent	48 (69.5)
	II	3 (4.3)
	III	3 (4.3)
	VI	6 (8.6)
	VII	4 (5.7)
	Bilateral 3 rd	1(1.4)
	III,VI	1(1.4)
B/LVI	1(1.4)	
III,VI,VII	2 (2.8)	

Majority of the patients were having normal fundus examination (67%) and most (58%) were having mild hyponatremia (table 4)

Table 4 Fundoscopic findings and frequency of hyponatremia in subjects studied (n=69)

Attribute	No./%age
Fundus examination	
Normal	46 (66.6)
Papilloedema	22 (31.8)
Optic Atrophy	1 (1.4)
Na (serum sodium level) meq/l	
105-115	4 (5.7)
116-125	12 (17.3)
126-135	40 (57.97)
136-145	13 (18.83)

Tuberculous Meningitis was almost similar in males and females (47% v/s 53%). Harsimran kaur *et al*^[2] also reported similar findings from north India. As much as 57(82.6%) cases belonged to rural areas reflecting the high incidence of tuberculosis in rural communities. As many as 49(71%) cases were in the age group of 15-45 years with a mean age of 36.26 years. Twenty three (33.3%) cases had definitive TBM, 6 (8.7%) were in highly probable category, 18(26.1%) in Probable and 22(31.9%) in Possible category. Duration of symptoms before seeking medical attention was between several

days to several weeks with a range of 2-150 days. Other researchers have also reported the similar findings.^[3,4] Forty two (60.9%) cases presented with severe disease (stage II in 26 (37.7%) and stage III in 16(23.2%); other studies also indicate that in resource-limited settings, TBM cases may present in advanced clinical stages.^[3-6] Headache was present in 65(94.2%), fever in 61 (88.4%), nuchal rigidity in 86.95%, vomiting in 51(73.9%) , altered sensorium in 23(34.78%) and seizure in 5(7.2%). Motor deficit was found in 11(16%) cases including monoparesis in 3(4.3%), hemiparesis in 3(4.3%) and paraparesis in 5 (7.2%). Cranial nerve palsy was seen in 21(30.5%); most common nerve affected being CN VI in 10(14.2%) followed by III in 7(9.9%) and VII in 6 (8.5%). Optic nerve involvement was found in 3(4.3%). Papilloedema was found in 22(31.8%) of cases and optic atrophy in 1(1.4%).The clinical spectrum of our cases was similar to that reported in the studies conducted by Husuglu *et al*^[7] and Jann-Tay-Wang *et al*.^[8]

Past history of pulmonary tuberculosis was present in 4(5.7%) cases in our study and family history of tuberculosis was present in 5(7.2%).Tuberculin test was positive in 19(27.53%) and radiological evidence of tuberculosis was seen in 5(7.2%). Forty seven (68%) had anemia i.e. Hb less than 12 g/dl with a mean Hb of 11.64 g/dl and 45(65.2%) had high corrected ESR with a mean value of 25.04 (table 6).

Table 6: Distribution of various clinical parameters with mean and standard deviation (n=69)

	Minimum	Maximum	Mean \pm Std. Deviation
Age	15	75	36.26 \pm 17.08
Symptom Duration	2	150	30.91 \pm 36.61
Hb	7.4	15.1	11.64 \pm 1.73
ESR	5	65	25.04 \pm 11.93
Blood. Glucose.	70	160	101.52 \pm 18.31
Na	108	142	127.85 \pm 6.24
CSF TLC	0	1200	222.55 \pm 227.77
CSF % Lymphocytes	0	100	74.26 \pm 30.25
CSF Glucose	0	79	41.79 \pm 17.34
Protein	16	1600	219.92 \pm 228.42
CSF ADA	4	43.6	16.47 \pm 9.96
Hospital Stay in Days	4	45	12.36 \pm 7.11

Hyponatremia is a well known complication of TBM arising as a result of SIADH (inappropriate secretion of antidiuretic hormone). In our study 56(81%) cases suffered from hyponatremia, though moderate to severe hyponatremia was seen only in 16(23%) cases. Roca

et al^[9] reported similar findings. CSF analysis of all the patients is presented in table 5. CSF parameters were in similar to findings reported by Chai Beng *et al*.^[10]

Table 5: Frequency distribution of various CSF parameters (n=69).

CSF (Cerebrospinal fluid parameter)		No.(%age)
CSF TLC (total leucocyte count/ μ l)	0-5	4 (5.7)
	6-100	15 (21.7)
	100-1000	48(69.5)
	>1000	2 (2.8)
CSF Lymphocyte %age	<50	11 (15.9)
	50-80	15 (21.7)
	>80	43 (62.3)
CSF Glucose (mg %)	>60	13 (18.8)
	30-60	34 (49.2)
	<30	22 (31.8)
Protein (mg %)	<45	4 (5.7)
	45-100	15 (21.7)
	101-500	46 (66.6)
	501-1000	3 (4.3)
	>1000	1 (1.4)
CSF ADA (adenosine deaminase level) units/ liter	<10	23 (33.3)
	10-30	37 (53.6)
	>30	9 (13)

CONCLUSION

Most of the patient with tuberculous meningitis present acutely. Headache and fever being most common symptoms while as nuchal rigidity, paraparesis and involvement of the cranial nerve VI being the most common neurological signs at the time of presentation.

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