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A Case Series of Tubercular Meningitis at Tertiary Care Center: A Retrospective Study

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Abstract: ***Introduction: Tuberculosis, a disease that has afflicted mankind since ancient times, is still a major public health problem in many parts of the world, especially in the developing countries of Asia and Africa. Tuberculosis can affect any part of the nervous system including meninges, brain and spinal cord. Tuberculous meningitis is by far the most common manifestation, accounting to 70% to 80% of all cases of Neurotuberculosis. This study aimed to see the clinical presentation, complication and prognosis of tuberculous meningitis patients in tertiary level hospital of Mangalore, Karnataka. Methods: A retrospective clinical case series of 41 patients was carried out in the department of medicine, K. S. Hegde medical academy Mangalore Karnataka from December 2013 to December 2017. Data was collected from medical records and presenting complaints, examination findings, laboratory findings, imaging reports and including treatment and complications details was noted. Results: In the present study, forty one patients were enrolled. Among the patients (22%) were aged between 15 to 30 years, (12%) were aged between 31 to 40 years, (29%) were aged between 41 to 50 years, (10%) were aged between 51 to 60 years and (27%) were aged above 60 years. Regarding gender 54% were males and 46 % were females. Most common symptom of presentation was fever 85% and other symptoms like headache (73%), vomiting (56%), altered sensorium (39%). The distribution of the patients based on the examination findings showed, 85% had neck rigidity, kernig sign was present in 65% and 26% had cranial nerve involvement and 26% showed long tracts involvement. In relation to the general condition at the presentation to the hospital, 25% patients had GCS less than 8, 33% had GCS 8 to 12 and 42% had GCS above 12. On CSF analysis 91% had lymphocyte predominant cell count and 70% patients had low glucose level in the CSF analysis. The most common complication of TB meningitis observed was persistent headache 31%, seizures in 17%, cranial nerve palsy in 12%, hemiparesis in 14% and decreased cognitive function in 17% and prognosis was good in younger the age, no comorbidity, GCS above 8 and earlier identification and initiation of ATT. Conclusion: clinical presentation and neurological examination is very helpful in diagnosing a Tubercular meningitis. In-spite of most of the time imaging study showing normal study, Diagnostic Lumbar puncture and CSF analysis in a clinically suspected patient plays a vital role in making a diagnosis of Tubercular Meningitis. Early diagnosis and initiating ATT was associated with reduced complications and overall good prognosis.***

Keywords: AFB-Acid Fast Bacilli, ATT- Anti Tubercular Treatment, TBM-Tubercular Meningitis

1. Introduction

Tuberculosis is one of the oldest known diseases affecting most of the organ systems of the human body. It is one of the leading causes of mortality and morbidity in developing countries. World Health Organisation estimates that 8. 6 million new cases of TB occurred in 2012 compared with 9. 24 million new cases in 2006 world over. India china, Indonesia, Nigeria and South Africa occupy the 1st to 5th positions in the total number of new cases. [1] CNS Tuberculosis is the still most common type of chronic CNS infection in developing countries. [1] Despite worldwide infection control programmes and powerful antibiotics, Tuberculosis of the central nervous system is still more than a historical relic.

The definitive evidence of tubercular meningitis is demonstration of the AFB in CSF and gold standard test remains culture of CSF. The detection rate of AFB in CSF is 15% to 20% and positivity of culture report may take up to 6 weeks with sensitivity around 80 %. Hence clinical manifestation with lymphocyte predominant CSF and low glucose level in CSF remains the important clue for the diagnosis. The Real time automated nucleic acid amplification (the Gene Xpert MTB/RIF assay) has sensitivity up to 80% and is preferred for initial diagnostic option. [2]

Early diagnosis and starting ATT reduces the mortality and morbidity and long-term complications in tubercular meningitis. [3, 8]

2. Materials and Methods

Sample design: A Retrospective study.
Study site: Justice K. S. Hegde Charitable hospital, unit of K. S. Hegde Medical Academy, Nitte University.
Period of study: December 2013 to December 2017.
Study population: A total of 41 patients aged above 15 years.
Inclusion criteria: Tubercular Meningitis diagnosed based on clinical presentation, CSF analysis and Imaging.
Exclusion criteria: Bacterial meningitis, viral meningitis and viral encephalitis.

3. Results

Table 1 shows the distribution of the patients in relation to Age.

Age in years	Frequency	Percentage
15 to 30	9	22
31 to 40	5	12
41 to 50	12	29
51 to 60	4	10
>60	11	27

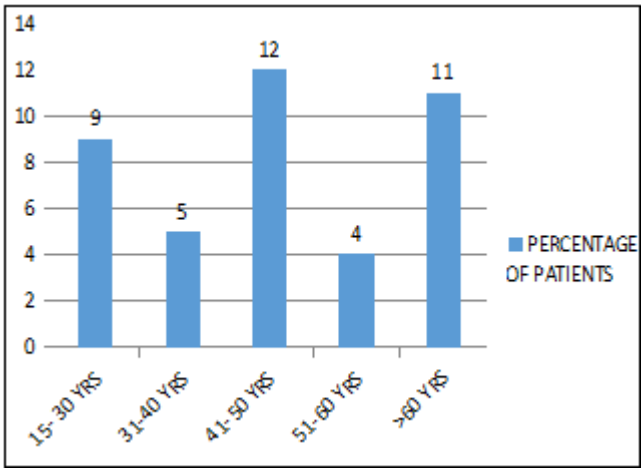

Figure 1: shows the distribution of the patients in relation to Age

In the present study most common age group affected was Middle age.

Table 2: Gender distribution of patients with Tubercular Meningitis

Sex	Frequency	Percentage
Male	19	46
Female	22	54

In the present study female were affected more than males, 54% and 46% respectively.

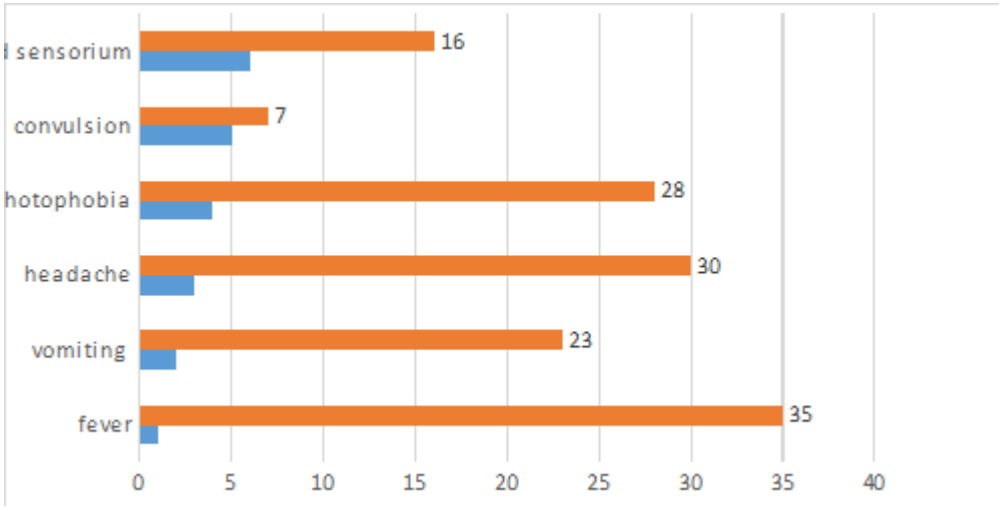

Figure 2: Distribution of patients based on the symptoms at presentation

Most common symptom of TBM in the present study was fever in 85% cases. Other symptoms were headache (73%), vomiting (56%), photophobia (51%), altered sensorium (39%) and convulsions (17%).

Table 3: Distribution of patients based on signs

Signs	frequency	Percentage
Neck rigidity	35	85
Cranial nerve palsy	11	26
Kernig sign	27	65
Papilloedema	7	17
Long tract sign	11	26

On examination most common finding observed was neck rigidity in 85% cases. Other signs were kernig sign (65%), long tract sign (26%), cranial nerve palsy (26%) and papilloedema (17%).

Table 4: Imaging findings in Tubercular Meningitis patients

Number of patients	CT/MRI findings
24	Normal
11	Cerebral infarct
1	Hydrocephalus
5	Meningeal enhancement

In the present study, 24 patients imaging was within normal limits and cerebral infarct in 11 patients, hydrocephalus in one patient and meningeal enhancement in 5 patients was observed. However three patients had both cerebral infarct and Meningeal enhancement was present. One patient had both meningeal enhancement and hydrocephalus.

Table 5: Co-morbidities in patients with Tubercular meningitis

Disease	frequency	Percentage
COPD	13	31
Old PTB	2	4
Diabetes	11	26
Heart failure	1	2
Connective tissue disorder	1	2
No co-morbidity	13	31

In the present study most common comorbidity in TBM patient was COPD (31%) and Diabetes (26%).

Table 6: CSF Analysis in patients with Tubercular Meningitis

	Low	Normal	High
Sugar	70%	30 %	-
Protein	46%	54%	-
ADA	-	42%	68%
Lymphocyte	-	9%	91%

In the present study, CSF analysis showed lymphocyte predominant cell count in 91% cases and low CSF sugar in 70% cases. CSF ADA was found high in 68% patients.

Table 7: Distribution of patients based on response to ATT in Tubercular meningitis

Response	Frequency	Percentage
Yes	40	97. 5
No	1	2. 5

In the present study, 40 patients out of 41 has responded to ATT and one patient died with aspiration pneumonia with type 1 respiratory failure who presented with stage 3 with complications to casualty.

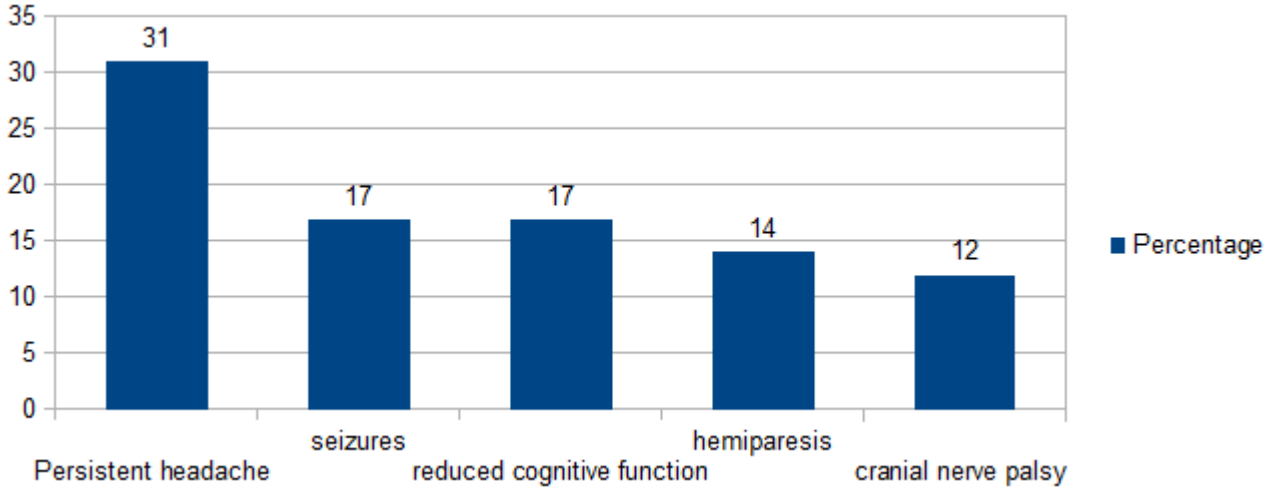

Figure 3: Long-term complications in tubercular meningitis

In the present study most common long term complication observed was persistent headache (31%) and other complications observed were seizures (17%) reduced cognitive function (17%) cranial nerve palsy (12%) and hemiparesis (14%).

4. Discussion

This present study was a retrospective study conducted in K. S. Hegde Charitable hospital Mangalore Karnataka from December 2013 to December 2017. There were total 41 patients with Tubercular meningitis was undertaken. The diagnosis of Tubercular meningitis was made based on clinical presentation, CSF analysis and imaging

In the present study the predominant age group affected was 41 TO 50 yrs and above 60yrs. The incidence of Tubercular meningitis in males was 54% and females were 46%. This study was similar to study conducted by Sarkar DN et al[4] with tittle, presentation of Tuberculous Meningitis patients: Study of 30 cases showed the incidence of Tubercular meningitis was more in males (56. 7%) compared to females (43. 3%).

In present study the most common symptom of presentation in Tubercular meningitis was fever with night sweats (85%)and it was similar to other study where the incidence of fever was 87%. [5, 6] GTCS was observed in 17% of the patients at the presentation and during the course of the hospital stay in the present study which was similar to other study where the incidence was 12. 1%[6]. Seizures were observed more in elderly patients and who presented late to the hospital in the present study. The signs of meningeal irritation like neck rigidity and Kernig sign were observed in 86% and 65 %respectively but in the other study neck rigidity and kernig sign was 54% and 40% respectively. [5] however regardless of the etiology, meningeal syndrome presents with similar symptoms. [9, 10]

In the present study most common GCS at presentation was above 12 which was 42%, GCS below 8 was 25% and GCS 8 to 12 was observed in 33% cases and Patients presented with low GCS had higher ICU admissions and longer hospital stay compare to higher GCS at presentation. Multiple cranial nerve palsy was observed in tubercular meningitis patients, most common cranial nerve to involve was obducent and fascial nerve and two patients had involvement of Glossopharyngeal and Vagus nerve was observed. In other study it was found 6th palsy in 7. 2% cases and also noted 3. 2% cases with isolated fascial nerve palsy in one study. [6] limb weaknesses were observed in 14% of the patients. [7] The power observed in affected limb was above grade 3 in affected patients.

The CSF analysis showed predominant lympocytic leucocytosis in 91% of the patients. The presence of lymphocyte predominant leucocytosis is characteristic feature of tubercular meningitis and was similar to other studies. [11, 12, 13] In this study, low glucose was observed in 70% patients. CSF ADA was increased in 68% Of Tubercular meningitis patients, was normal in 42% Patients.

In the present study CSF ZN staining for AFB was negative in all patients and CSF culture showed positive in 14% Patients where as several case series established CSF culture sensitivity of AFB was 25 to 70%. [14]

All 41 patients received ATT, among them 40 patients responded and 1 patient died in ICU who presented with stage 3 with complications. Patients with Tubercular

meningitis had a long term complications like persistent headache (31%), recurrent seizures (17%), hemiparesis (14%), cranial nerve palsy (12%) and reduced cognitive function (17%). Most of the patients with long-term complications were with low GCS and late presentation to the hospital signifying early diagnosis and early treatment reduces mortality and morbidity in Tubercular meningitis patients. It is generally believed that coma and delayed initiation of therapy were predictors of poor outcome. Similar experiences in relation to outcome has been described in many studies[15, 16, 17]

Clinical presentation and neurological examination is very helpful in diagnosing Tubercular meningitis. In-spite of most of the time imaging study showing normal study, Diagnostic Lumbar puncture and CSF analysis in a clinically suspected patient plays a vital role in making a diagnosis of Tubercular Meningitis. Early diagnosis and initiating ATT was associated with reduced complications and overall good prognosis.

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