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TUBERCULOUS MENINGITIS;
FREQUENCY OF MORTALITY IN PATIENTS PRESENTING IN BAHAWAL VICTORIA HOSPITAL BAHAWALPUR

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ABSTRACT… Background: Central nervous system (CNS) tuberculosis constitutes 6% of all tuberculosis cases and tuberculous meningitis (TBM) is the most serious manifestation. Despite effective anti-tuberculous medicines, 20-50% of tuberculous patients die and significant number of patients have neurological deficits. Failure to initiate anti-tuberculous therapy in the early stages of the disease may lead to significant morbidity and mortality. **Setting:** MW-1, MW-III and MW-IV of Bahawal Victoria hospital Bahawalpur. **Methods:** All patients of tuberculous meningitis diagnosed on the basis of the clinical criteria and cerebrospinal fluid examination (WBC $\geq$ 15, predominant lymphocytes and sugar level $\leq$ 40 mg/dl) were included in the study. Age, gender, and GCS level of the patients were recorded. Every patient was observed for mortality within two weeks after admission (within ward or enquired on mobile phone if patient was discharged early). **Results:** A total of 73 patients were included in the study. The mean age of patients was 36.71 years with standard deviation of 17.161 years. Out of 73 patients, 31 (42.47%) patients were male and 42 (57.53%) were female. Out of 73 patients, 12 (16.44%) patients of tuberculous meningitis had mortality while 61 (83.56%) patients had no mortality. **Conclusion:** Tuberculous meningitis is a chronic illness with relatively high mortality and morbidity. Low level of consciousness on admission to hospital is an important predictor for mortality.

Key words: Tuberculous meningitis, TBM, mycobacterium tuberculosis, mortality, central nervous system, CNS.

INTRODUCTION

Central nervous system (CNS) tuberculosis constitutes 6% of all tuberculosis cases and tuberculous meningitis (TBM) is the most serious manifestation. Despite effective anti-tuberculous medicines, 20-50% of tuberculous patients die and a number of patients have neurological deficits.[1] Failure to initiate anti-tuberculous therapy in the early stages of the disease may lead to significant morbidity and mortality.[2,3] According to the World Health Organizations (WHO), Pakistan stands eighth on the list of high-burden tuberculosis countries in the world.[4]

TBM is characterized by progressing inflammatory process of granulomatous type in brain, spinal cord and meninges. It leads to a number of complications, such as end arteritis of brain and spinal cord, hydrocephalus, tuberculoma, arachnoiditis, multiple cranial nerves palsies due to basal meningitis and death. Fever, headache and malaise can be absent in 25-60% of patients.[5] Other patients may show low grade fever, headache, mental status changes, visual impairment, monoplegia/monoparesis, hemiplegia/hemiparesis, quadriplegia/quadriparesis, paraplegia/paraperesis and/or aphasia.[6] TBM should be a strong suspicion in high-risk groups like malnutrition, alcohol or drugs abusers, homeless persons, people in correctional and long term care facilities and HIV patients.[7]

Nonspecific symptoms and signs may pose a challenge in the diagnosis of tuberculous meningitis. Unfortunately, there is no single diagnostic test that may provide rapid, specific and sensitive results. Picture of cerebrospinal fluid (CSF) in tuberculous meningitis (TBM) may resemble to the picture of CSF in many

other infectious and noninfectious meningeal involvement.[8] Sensitivity of CSF staining for mycobacterium tuberculosis is <20% while sensitivity of culture lies between 25-70%. Similarly, the sensitivity of commercially available polymerase chain reaction for DNA of mycobacterium tuberculosis is noted 56%.[9] So, the diagnosis of tuberculos meningitis is based on the specific clinical picture, cerebrospinal fluid changes and radiological findings.[10]

Prompt diagnosis and early anti-tuberculous therapy are crucial.[11] WHO guidelines recommend a 6 months course of treatment and other guidelines recommend a prolonged treatment extended to 9 or 12 months. In our set up, isoniazid, rifampicin, pyrazinamide and ethambutol are prescribed for two months followed by isoniazid and rifampicin for at least 10 months. Corticosteroid is added for 3-6 weeks.[12] This study had analyzed the frequency of mortality in patients of TBM in our local population at Bahawal Victoria Hospital Bahawalpur.

MATERIAL AND METHODS

This study was conducted at MW-1, MW-III and MW-IV of Bahawal Victoria hospital Bahawalpur. After informed written consent from the patients or their attendants, all patients diagnosed as TBM on the basis of the clinical criteria (low grade fever, headache, malaise, nausea/vomiting, altered mental status and/or focal neurological deficit) and cerebrospinal fluid examination (WBC ≥ 15, predominant lymphocytes and sugar level ≤ 40 mg/dl) were included in the study. Age, gender, and GCS level of the patients were recorded. CT scan brain was done in each patient. Every patient was observed for mortality within two weeks after admission (within ward or enquired on mobile phone if patient was discharged early). The data was entered on already designed proforma.

RESULTS

A total of 73 patients were included in the study. The mean age of patients was 36.71 years with standard deviation of 17.161 years. Median age of patients was 32 years, the minimum age of patients was 15 years, maximum age of patients

was 75 years and range age of patients was 60 years. Out of 73 patients, 31 (42.47%) patients were male and 42 (57.53%) were female. On admission, 66 (90.41%) patients had GCS >8 and 7 (9.59%) had GCS ≤ 8. The frequency of mortality is shown in Figure-1. Mortality in different gender of patients with insignificant p value of 0.224 is shown in Figure-2. According to GCS of patients, 6 (9.1%) patients out of 60 having GCS >8 had mortality while 6 (85.7%) patients out of 7 having GCS ≤ 8 had mortality. Mortality in different age groups of patients with insignificant p value of 0.221 is shown in Table-I.
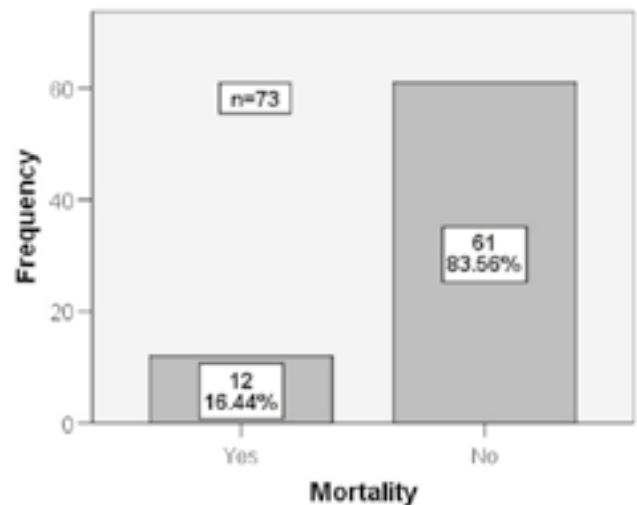
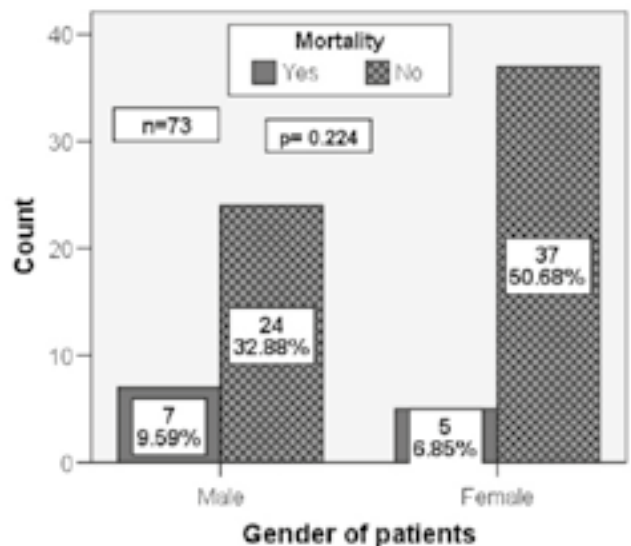

Figure-1. Frequency of mortality

Figure-2. Mortality in different gender of patients

		Age group of patients			Total	p-value
		13-35 years	36-55 years	56-75 years		
Mortality	Yes	6 8.2%	2 2.7%	4 5.5%	12 16.4%	0.221
	No	38 52.1%	15 20.5%	8 11.0%	61 83.6%	
Total		44 60.3%	17 23.3%	12 16.4%	73 100.0%	

Table-I. Mortality in different age group of patients

DISCUSSION

Tuberculous meningitis (TBM) is a serious health related issue in either gender of all age groups in developing countries. Infection starts with inhalation of mycobactrium tuberculosis bacilli, which then spreads to the brain and meninges to cause tuberculoma/meningitis. Vague and nonspecific symptoms are very common and it is very hard to distinguish tuberculous meningitis from other types of bacterial and viral meningitis. A long history of illness (over 15-20 days) is highly suggestive of tuberculous meningitis. An important predictor of mortality is the presence of seizures or decrease level of consciousness while focal neurological deficit may be sign of neurological sequelae.[13]

In our study, the mean age of patients was 36.71 ±17.161 years. These results were very close to the study that was done by Salekeen S et al[14] in which the mean age was 36.29±16.7 years with an equal male to female ratio. In another study conducted by Hosoglu S et al[15] showed that the mean age was 33 years. Cagatay AA et al[16] also showed that the mean age was 33.9±13.2 years.

In our study, the mortality of tuberculous meningitis patients was 16.44%. These results were comparable to the results of other studies. Salekeen S et al[14] showed an overall mortality 21.1%. In another study, Hosoglu S et al[15] studied 434 patients. 23.3% patients of the total died due to complications and 27% patients had permanent neurological sequelae. In another study, Qureshi HU et al[17] analyzed 190 patients and found that overall mortality was 20% and neurological sequelae were present in 42% of the survivors. In their patients, the most common features were headache, fever, depressed level of consciousness and nausea/vomiting. Fazel PA et al[18] found the mean age was 29.65 years that was slightly lesser than the mean age of our study. Among studied cases, 75% patients survived and 25% patients had mortality.

Mortality rates of tuberculous meningitis patients have been reported 41%[19] and 7%[30] in developed nations such as the United States and Australia respectively. In high HIV prevalence countries, the mortality rates is also high like in South Africa 69%[21] and in Vietnam 67%.[22]

An early diagnosis of tuberculous meningitis is crucial for better outcome. Any delay in diagnosis is a dangerous practice and it may lead to deep coma and focal neurological deficits that are bad prognostic factors. If TBM is suspected, it is strongly recommended that empiric treatment should be started immediately until it is proved otherwise. This practice should be done not only in the developing countries but also in more developed nations. It will be a great contribution that a general physician as well as neurologist should pick up a case of tuberculous meningitis having non-specific features of disease.

CONCLUSION

Tuberculous meningitis is a chronic illness with relatively high mortality and morbidity. Low level of consciousness on admission to hospital is an important predictor for mortality. Although the diagnosis of tuberculous meningitis is difficult, clinicians must be prompt to start empirical therapy. Early identification of such patients and subsequent initiation of anti-tuberculosis therapy may improve their outcome.
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AUTHORSHIP AND CONTRIBUTION DECLARATION

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