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CLINIORADIOLOGICAL PROFILE OF CHRONIC MENINGITIS: STUDY FROM A TERTIARY CARE CENTRE

Neurology

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ABSTRACT

Background: Chronic meningitis is a clinical syndrome of meningeal inflammation diagnosed on the basis of clinical features and/or cerebrospinal fluid finding persisting for 4 weeks or more.

Aiims and Objectives: The present study was carried out to evaluate the clinicoradiological profile of patients with chronic meningitis. Seventy five patients who fulfilled the inclusion criteria were enrolled from April 2011 to September 2012.

Material and methods: All patients were subjected to a detailed history followed by a thorough general and neurological evaluation. Neuroimaging CT/MRI and Cerebrospinal fluid (CSF) examination was carried in all. Cytological and biochemical studies with smear examination and culture were done immediately after sample collection.

Results: Age range from 11-70 years and mean age was 32.34+_15.03years . Tubercular meningitis(TBM) was the leading cause chronic meningitis seen 71 (94.7%) patients followed by cryptococcal meningitis 4 (5.3%). Headache , fever and vomiting were the commonest symptoms of which the first two were present in 100% patients in both groups. Papilloedema was present in all patients of cryptococcal and 61 patients of TBM. Sixth cranial nerve was the commonest nerve involved in both groups Vision loss (p=0.028), facial weakness (p=<0.001), motor weakness (p=<0.001) seizures (p=0.002) , a GCS of < 10 (p<0.001) and presence of infarct and grade III meningitis portended a worse prognosis (p-value <0.001) in both groups.

Conclusion: Tubercular meningitis is the leading cause of chronic meningitis in our country. Early treatment should be started even in culture negative cases to prevent neurological complications which portend a worst prognosis

KEYWORDS

tubercular meningitis, chronic meningitis, cryptococcal meningitis

INTRODUCTION

Chronic meningitis involves varying combinations of fever, headache, meningismus, mental status changes, seizures, and focal neurologic deficits persisting for more than 4 weeks ,accounting for almost 10% of all cases of meningitis(1) Unusual presentations include brain stem stroke, psychosis, movement disorder, and extrapyramidal syndrome. Clinical abnormalities can be subtle, and may be diagnosed earlier than 4 weeks with the advent of newer diagnosed techniques. Almost all patients show CSF pleocytosis, although there are rare examples of biopsy- or autopsy-verified meningeal inflammation despite consistently acellular CSF. The fast and accurate laboratory diagnosis of the cause of chronic meningitis is of the utmost importance in order to direct therapy, especially in immune compromised patients, where this type of infection is both common and life-threatening.

MATERIAL AND METHODS:

The present study was carried out at a tertiary care university hospital from April. 2011 to Sept. 2012. Patients with fever, headache, vomiting, neck stiffness and /or focal neurological deficit (either alone or any combination) for > 4 weeks were included. A valid informed consent was taken following which all the patients were subjected to a detailed clinical history, physical and neurological (including oculi fundi), biochemical and radiological examination (CT/MRI brain), as per the standard protocol prepared by us. The past history of any illness, history of chronic illness, personal history of addiction, drugs/ toxin exposure, occupational, dietary habits and family history were recorded. A total of 75 cases of clinically suspected and CSF suggestive cases of chronic meningitis were enrolled in the study. All patients who had a history of significant head trauma , drug or toxin exposure, significant metabolic derangements or structural abnormalities in the MRI (not consistant with tuberculous meningitis) were excluded.

3-5 ml of CSF was obtained from each patient by lumbar puncture in a sterile vial prior to start of any therapy for the following purposes: Cytological and Biochemical Studies ,AFB Smear, Gram staining , India ink examinationand cryptococcal antigen and CSF culture for bacterial and fungal isolation . The cytological and biochemical studies with smear examination and culture were done immediately after sample collection.

The total diagnostic index (DI) for each patient is calculated according to the formula as proposed by Thwaites et al(2).: DI (age) + DI (blood WBC) + DI (history of illness) + DI (CSF white cell count) + DI (CSF % neutrophils) . total score is 13. Patients with DI scores ,<4 are classifi ed as having tuberculous meningitis while those with DI scores > 4 are classified as having a version of bacterial meningitis.

Thwaites DI scores for TBM

Parameters	DI
Age, years	
>35	2
<35	0
Blood WBC, 103/ml	
>15,000	4
<15,000	0
History of illness, days	
>6	-5
<6	0
CSF total WBC, 103/ml	
>900	3
<900	0
CSF % neutrophils	
>75	4

<75 0

CT scan/MRI brain were performed in all patients.

Tubercular meningitis patients are graded according to Modified British Medical Research Council(3) TBM Severity Grades : Grade I-Alert and orientated without focal neurological deficit;Grade II-Glasgow coma score 14-10 with or without focal neurological deficit or Glasgow coma score 15 with focal neurological deficit; Grade III-Glasgow coma score less than 10 with without focal neurological deficit

Statistical methods:

Mean, standard deviations had been calculated for quantitative variables.. Student 't' test had been used to test the significant difference between the mean of two groups. For qualitative and categorical variables, X^2 and Z-test had been applied to test the significant difference between two proportions. P-value <0.05 considered as statistically significant.

RESULTS

In the present study the age rangeg from 11-70 years and mean age was 32.34±15.03years. Maximum patients were in 3rd decade of life. There was a slight male preponderance with 40 males and 35 females. Maximum patients (65.3%) presented with 4-8wks duration of symptoms, followed by (22.7%) in 8-12wks duration, (4%) in 12-16weeks and (8%) >16weeks duration of symptoms. History of tuberculosis was present in (8.5%)in TBM group and HIV +ve status was present in (75%)in cryptococcal meningitis patients.

Fever and headache was the commonest symptom present in all patients . In the TBM patients this was followed by vomiting(66.2%) , diplopia (42%), seizures (25.4%), weight loss (21.1%), motor weakness (11.2%) neck pain(9.9%), cough (7%)vision loss(5.6%) and facial weakness (4.2%).

In the cryptococcal patients vomiting (100%) was the commonest, followed by double vision , motor weakness, seizures, and weight loss (75%),facial weakness (50%) and vision loss and cough (25%) each Based on the CSF picture tubercular meningitis was the (71, 94.7%) the most common diagnosis followed by Cryptococcal meningitis (n=4,5.3%). Sixth cranial nerve was the commonest nerve involved in both groups, followed by occulomotor nerve in TBM and facial nerve in the cryptococcal group. Papilloedema was present in all four patients of cryptococcal meningitis and 62/71 patients of TBM. . CSF-in tubercular meningitis showed mean value of TLC (166.21±159.23) with lymphocyte (73.11±18.74) pleocytosis, sugar (41.79±15.14), CSF serum sugar ratio(0.400.15),Protein (177.80136.10) and ADA was positive in 46(64.8%) patients with mean value(13.44+_6.17). CSF smear and culture for acid-fast baclli were negative in all patients.

In cryptococcal meningitis CSF shows mean TLC(141±135.04) with neutrophil (46.25±20.56) and lymphocyte (47.50±15), sugar (38.50±13.27). protein raised (269.75±142.33) . CSF showed india ink stainig +ve in 3(75%), culture and cryptococcal.antigen were positive in all patients.

The clinical profiles revealed that vision loss (p=0.028), facial weakness (p=<0.001), motor weakness (p=<0.001) seizures (p=0.002) and a GCS of < 10 (p<0.001)had a significant association with mortality . All the patients with a lower ESR, lower CSF cell count and protein (n=67) survived (p< 0.05) as compared to those with higher values (n=8)who expired.

Meningeal enhancement was the commonest radiological abnormality(n=55) followed by hydrocephalous(n=19) and infarct and tuberculoma (n=8 each).In radiological profile only infarct has significant association with outcome with 08 patients (75%) who expired(p-value <0.001). There was significant association with meningitis grade, p-value (<0.001), maximum death in grade 3(75%). The number of patients graded I , II and III of meningitis were 27, 37 and 7 for TBM group and 0, 2 and 2 in the cryptococcal group. Overall 36% were grade I, 52% grade II and 12% grade III.

DISCUSSION

The present study was carried out to evaluate the clinical , Biochemical and Radiological profile of 75 patients with chronic meningitis at a tertiary care university hospital.In the present study tubercular meningitis was seen in 94.7% and cryptococcal meningitis in 5.3% of patients. Similarly in a study from New Zealand published in1987 (4) the commonest cause of chronic meningitis amongst previously healthy 83 patients was tuberculosis in (40%), followed by malignancy (8%), cryptococcosis (7%), with no cause being found in 34% patients. In a study from Thailand (5) commonest aetiology was cryptococcus (54%) followed by TBM in (37%) patients.

All our patients of TBM are probable case of meningitis based on clinical and laboratory parameters (smear and culture negative for AFB).Out of 71 patients ,meningitis grade 1in 27(38%),grade 2 in 37(52.1%) and grade 3 in 7(9.9%) patients. this was similar to other studies (4,6) who showed maximum number of patients in grade II similar to our study. All patients had a lymphocytic pleocytosis with raised protein in the CSF. The ADA levels were higher in TBM patients which is consistant with other studies and guides the clinician to start early treatment .(7)

On clinical evaluation most common symptoms headache and fever present in all patients. Vomiting (66.2%), double vision (42.3%), motor weakness (11.2%), seizure (25.4%), cough (7%), vision loss (5.6%)and weight loss(21.1%),symptoms present in our study which is comparable to other studies(8,9,10)

In cranial nerve involvement, 6th(38.02%) was most common followed by 3rd(11.26%),7th(4.22) and 2nd(2.81%)of patients. Multiple cranial neuropathy occurs as a result of basal meningitis and has been known as an important feature of TBM (10) Sixth cranial nerve palsy may also occur as a false localizing sign.

In the TBM group brain imaging(CT/MRI) showed meningeal enhancement in (83.1%) which was the most common finding, followed by hydrocephalous-communicating (29.6%)and non-communicating (1.4%) and infarct was seen in (16.90%) patients. Amongst the infarct patients, cerebral infarcts were commonest (12.67%) followed by basal ganglia infarcts seen in 7.04%, thalamus (2.81%), cerebellum and multiple infarct each in (1.41%), . Tuberculomas were seen in (14.08%) patients with the most common site in frontal lobe(5.63%) which is almost comparable to other studies. Tuberculomas were found in 36.6% cases (almost double to our series) , with infarcts in 8.9% in a review of 160 cases of TBM from Turkey (10). In a study from India on initial MRI, meningeal enhancement was seen (88.2%), hydrocephalus (30.9%) and infarcts (24.5%) were also noted(7) The percentage of tuberculomas and infarct appears to be more in this study probably because the imaging modality was MRI , while in our series majority patients had CECT brain with only 1/3 patients undergoing an MRI .

In the present study Cryptococcal meningitis 4(5.3%) was the second common cause of chronic meningitis . The HIV +ve status was seen in 3(75%)and HIV_-ve was seen in 1(25%) patient . HIV positivity was found in 79% of cryptococcal meningitis and 7% of TBM patients in a study from Thailand (3) Similarly other studies have also described a greater prevalence of cryptococcal meningitis in HIV +ve individuals as compared to TBM. (11,12,13,14)

In our study fever,headache and vomiting were most common symptoms present in all, with headache as the most dominant symptom (11,12) described in patients . This is followed by double vision,motor weakess and seizure each in 3(75%),facial weakness 2(50%) ,vision loss in (25%) patients , which has been invariably described in other series.(11,12,13,14,15)

Clinical signs revealed meningeal signs(NR and KS) in all patients. Among the cranial nerves ,6th was commonest (75%)followed by 7th(50%),motor weakness(50%) . Papilloedema was present in all patients . Two patients had a GCS of < 10. And the remaining 02 were between 10-14. Presence of altered sensorium has been known to be associated with an invariably worse outcome(9) In our study CECT brain revealed an seen in 2 patients,(50%) –basal ganglia and multiple infarct each in 1(25%) patients and meningeal enhancement in 1 (25%) patients. The common findings described in cryptococcal meningities are leptomeningeal enhancement, followed by dilatation of perivascular spaces with the presence of mucoid material. (16). In a series of 66 patients from India lacunar infarcts were found in 13% patients of which almost 50% had multiple infarcts(17)This was associated with a worse prognosis . Similarly in our study all patients in the cryptococcal group died.

CONCLUSION :

Thus our study highlighted tubercular meningitis as the commonest cause of chronic meningitis in the hospital setting . Cryptococcal meningitis is associated with a high mortality . A higher grade of meningitis, seizures, motor deficits and cranial nerve involvement portends a bad prognosis. Early diagnosis should be made on clinical symptoms and signs supported by CSF analysis and brain imaging. Prompt treatment is to be started without awaiting culture reports to prevent the devastating complications.

REFERENCES

(1) Colombe B, Derradji M, Bosseray A, et al. Chronic meningitis: aetiologies, diagnosis and treatment. Rev Med Interne 2003; 24:24-33.
(2) G E ThwaitesChau Hong Tran Kasia Stepniewska et al Diagnosis of Adult tuberculous meningitis by use of clinical and laboratory features. The Lancet 2002;360(9342):1287-92
(3) Thwaites GE , Nguyen DB, Nguyen HD , et al. Dexamethasone for the treatment of tuberculous meningitis in adolescents and adults , N Engl J Med , 2004 , vol. 351 (pg. 1741 – 51)
(4) Anderson NE, Willoughby EW. Chronic Meningitis without Predisposing Illness—A Review of 83 Cases. QJM: An International Journal of Medicine 1987; 63:283 - 295.
(5) Helbok R, Pongpakdee S, Yenjun S, et al. Chronic meningitis in Thailand. Clinical characteristics, laboratory data and outcome in patients with specific reference to tuberculosis and cryptococcosis.Neuroepidemiology 2006; 26:37-44.15.
(6) Khalid Sher1, Firdaus1, Amanullah Abbasi2, Naeemullah Bullo1 and Suneel Kumar1. Stages of Tuberculous Meningitis: a Clinicoradiologic Analysis. Journal of the College of Physicians and Surgeons Pakistan 2013, Vol. 23 (6): 405-408 405
(7) Moghtaderi A, Niazi A, Alavi-Naini R, et al. Comparative analysis of cerebrospinal fluid adenosine deaminase in tuberculous and non-tuberculous meningitis. Clin Neurol Neurosurg 2010; 112:459-62.
(8) H. K. Anuradha, R. K. Garg, M. K. Sinha, A. Agarwal, R. Verma, M. K. Singh, R. Shukla. Intracranial tuberculomas in patients with tuberculous meningitis: predictors and prognostic signifi cance. INT J TUBERC LUNG DIS 2011; 15(2):234–239.
(9) Sanjeev Kumar, Rajesh Verma, Ravindra K. Garg, Hardeep S. Malhotra, Praveen K. Sharma. Prevalence and outcome of headache in tuberculous meningitis Neurosciences 2016; Vol. 21 (2): 138-144
(10) Filiz Pehlivanoglu, Kadriye Kart Yasar, and Gonul Sengoz .Tuberculous Meningitis in Adults: A Review of 160 Cases. The Scientific World Journal Volume 2012, Article ID 169028, 6 pages doi:10.1100/2012/169028
(11) Satishchandra P, Mathew T, Gadre G et al. Cryptococcal meningitis: Clinical, diagnostic and therapeutic overviews. Neurol India 2007; 55:226-32.
(12) Aslan SMS, Chandrasekhara P. Study of cryptococcal meningitis in HIV seropositive patients in a Tertiary Care Center. JIACM 2009; 10:110-115.
(13) Lee YC, Wang JT, Sun HY, Chen YC.Comparisons of clinical features and mortality of cryptococcal meningitis between patients with and without human immunodeficiency virus infection. J Microbiol Immunol Infect. 2011 Oct;44(5):338-45. doi: .1016/j.jmii.2010.08.011. Epub 2011 Jan 20.
(14) Badave RR, Basavaraj A. Clinical Profile of Cryptococcal Meningitis in Patients Living with HIV Infection: An Experience from Western India. Med J DY Patil Vidyapeeth 2018;11:28-32.
(15) Lúcia Kioko Hasimoto e Souza, Carolina Rodrigues Costa, Orionalda de Fátima Lisboa Fernandes, Fernando Yano Abrão, Thaisa Cristina Silva,Carolina Martins Treméa and Maria do Rosário Rodrigues Silva .Clinical and microbiological features of cryptococcal meningitis. Revista da Sociedade Brasileira de Medicina Tropical 2013 46(3):343-347, May-Jun, 2013.
(16) Stenio Bruno Leal Duarte1, Mariana Mari Oshima1, João Vitor do Amaral Mesquita1, Felipe Barjud Pereira do Nascimento2 , Paula Christina de Azevedo3 , Fabiano R Magnetic resonance imaging findings in central nervous system cryptococcosis: comparison between immunocompetent and immunocompromised patientseis Radiol Bras. 2017 Nov/Dez;50(6):359–365
(17) Mishra AK, Arvind VH, Muliyil D, Kuriakose CK, George AA, Karuppusami R, Benton Carey RA, Mani S, Hansdak SG. Cerebrovascular injury in cryptococcal meningitis.Int J Stroke. 2018 Jan;13(1):57-65. doi: 10.1177/1747493017706240. Epub 2017 Apr 19.