ORIGINAL ARTICLE

Polymerase Chain Reaction in Clinically Suggestive Tuberculous Meningitis

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ABSTRACT

Aim: To describe the results of polymerase chain reaction test on cerebrospinal fluid, in clinically suggestive cases of tuberculous meningitis.
Methods: This descriptive study was conducted in the Department of Paediatric Medicine, Nishtar Hospital, Multan from October 2013 to March 2014. A total of 80 patients aged 6 months to 12 years, admitted in the ward with suspicion of tuberculous meningitis were evaluated.
Results: Regarding cerebrospinal fluid analysis, 14(17.5%) patients showed normal picture whereas 66(82.5%) had abnormal picture. As regards PCR test for tuberculosis, 34(42.5%) patients were negative and remaining 46(57.5%) patients were positive.
Conclusion:- PCR can be used as a rapid diagnostic test in clinically suggestive tuberculous meningitis when CSF is negative for microscopic examination.
Keywords: Tuberculous meningitis, Polymerase chain reaction, PCR.

INTRODUCTION

Pakistan is unfortunately among the six countries where incidence of tuberculosis is very high[1]. Tuberculous meningitis (TBM) is the most common form of chronic infection of the central nervous system (CNS)[2]. It is a serious illness often with atypical clinical, biochemical and radiological features[3].TBM complicates about 0.3% of untreated tuberculosis infection in children. It is most common in children between 6 months and 4 years of age[4].

Death from TBM is strongly associated with delay in diagnosis and treatment[5]. Conventional methods namely microscopy and culture techniques are less sensitive and time consuming[6]. In the context of limitations of conventional diagnostic methods, nucleic acid amplification (NAA) tests have emerged to make a rapid and accurate diagnosis. Polymerase chain reaction is the best known and the most widely used NAA. All NAA tests amplify target nucleic acid region (DNA or RNA) that uniquely identify the mycobacterium complex[7]. The PCR is an easy and quick method of getting unlimited copies of DNA.

METHODOLOGY

This descriptive study was carried out in the Department of Paediatric Medicine, Nishtar Hospital, Multan from October 2013 to March 2014. A total of 80 patients aged 6 months to 12 years, admitted in the ward with suspicion of tuberculous meningitis were evaluated. History; examination; X-ray chest and tuberculin test were performed. PPA scoring done. Patients with suggestive tuberculous meningitis and three or more other scores of PPA scoring chart were selected for PCR test.

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RESULTS

The age range was six months to 12 years. Mean age was 3.4±2.9 years with 32(40%) patients below 2 years and remaining 48 (60%) of age 2 years or above. Out of 80 patients, 52(65%) were male and 28(35%) were female. Regarding cerebrospinal fluid analysis, 14(17.5%) patients showed normal picture whereas 66(82.5%) had abnormal picture. As regards polymerase chain reaction test for tuberculosis, 34(42.5%) patients were negative and remaining 46(57.5%) patients were positive. PCR was positive in 4 patients with normal CSF examination.

Table 1: Presenting complaints

Complaints	n	%age
Fever	80	100
Fits	65	81.3
Coma	64	80
Headache	54	67.5
Irritability	38	47.5

Table-2: Physical findings

Findings	n	%age
Cranial nerve palsy	27	33.8
Neurological defect	58	72.5
Meningial irritation	80	100.0
Papilledema	37	46.3

Table-3: PPA score

PPA score	n	%age
07	38	47.5
08	21	26.3
09	08	10.0
10	10	12.5
11	03	03.7

DISCUSSION

TB is a chronic systemic infectious disease caused by mycobacterium tuberculosis. TB of the CNS is a most serious complication having poor prognosis with fatality rate ranging from 44-69% in developing countries[8]. CNS is involved by hematogenous spread from a primary focus usually in the lungs[9].

TBM is more common in children of age less 5 years[10] In our study, mean age of the patients was 3.4±2.9 years, with predominant male patients. Both, mean age and gender are comparable with other study[11] Fever was present in all patients which is also a frequent feature[12]. Other major presenting complaints were fits 65(81.3%), coma 64(80%) and headache 54(67.5%) patients. In our study, PCR on CSF for mycobacterium tuberculosis was positive in 46(57.5%) patients of clinically suggestive TBM, which is comparable with regional studies[13]. In an Indian study, PCR was positive in 5 out of 8(62.5%) highly probable cases of TBM[8].

Zahida (2002)[14] from Karachi has reported PCR sensitivity in TBM patients as 35%, but her study is somewhat different in a way that she performed PCR test on culture proven CSF samples. However, study results of Tabassum (1999)[15] from Lahore are comparable. In his study, PCR was positive in 32 (56.4%) cases of clinically highly probable tuberculous meningitis. Positivity of PCR in 4(28.6%) patients having normal CSF in our study signifies that in patient having stronger clinical evidence of TBM, normal CSF picture does not exclude the diagnosis.

CONCLUSION

PCR can be advocated in many cases of clinically suggestive TBM when other tests like CSF picture and ZN staining are inconclusive.

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