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Imaging Spectrum of Central Nervous System Tuberculosis on Magnetic Resonance Imaging: Correlation with Clinical and Microbiological Results

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Abstract : Aims and Objectives: Intracranial tuberculosis (TB) is one of the most devastating manifestations of TB and a challenging public health issue of considerable importance and magnitude world over. This study elaborates on the imaging spectrum of neurotuberculosis on magnetic resonance imaging (MRI) in 29 clinically suspected cases from a tertiary care hospital. Materials and Methods: The prospective hospital based evaluation of MR imaging features of neuro-tuberculosis in 29 clinically suspected cases was carried out in Department of Radio-diagnosis, Indira Gandhi Medical Hospital from July 2017 to August 2018. MR Images were obtained on a 1.5 T Magnetom Avanto machine and were analyzed to identify any abnormal meningeal enhancement or parenchymal lesions. Microbiological and Biochemical CSF analysis was performed in radiologically suspected cases and the results were compared with the imaging data. Clinical follow up of the patients started on anti-tuberculous treatment was done to evaluate the response to treatment and clinical outcome. Results: Age range of patients in the study was between 1 year to 73 years. The mean age of presentation was 11.5 years. No significant difference in the distribution of cerebral tuberculosis was noted among the two genders. Imaging findings of neuro-tuberculosis obtained were varied and non specific ranging from lepto-meningeal enhancement, cerebritis to space occupying lesions such as tuberculomas and tubercular abscesses. Complications presenting as hydrocephalus (n= 7) and infarcts (n=9) was noted in few of these patients. 29 patients showed radiological suspicion of CNS tuberculosis with meningitis alone observed in 11 cases, tuberculomas alone were observed in 4 cases, meningitis with parenchymal tuberculomas in 11 cases. Tubercular abscess and cerebritis were observed in one case each. Tuberculous arachnoiditis was noted in one patient. Gene expert positivity was obtained in 11 out of 29 radiologically suspected patients; none of the patients showed culture positivity. Meningeal form of the disease alone showed higher positivity rate of gene Xpert (n=5) followed by combination of meningeal and parenchymal forms of disease (n=4). The parenchymal manifestation of disease alone showed least positivity rates (n= 3) with gene xpert testing. All 29 patients were started on anti tubercular treatment based on radiological suspicion of the disease with clinical improvement observed in 27 treated patients. Conclusions: In our study, higher incidence of neuro- tuberculosis was noted in paediatric population with predominance of the meningeal form of the disease. Gene Xpert positivity obtained was low due to paucibacillary nature of cerebrospinal fluid (CSF) with even lower positivity of CSF samples in parenchymal form of the manifestation. MRI showed high accuracy in detecting CNS lesions in neuro-tuberculosis. Hence, it can be concluded that MRI plays a crucial role in the diagnosis because of its inherent sensitivity and specificity and is an indispensible imaging modality. It caters to the need of early diagnosis owing to poor sensitivity of microbiological tests more so in the parenchymal manifestation of the disease.

Keywords : neurotuberculosis, tubercular abscess, tuberculoma, tuberculous meningitis
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