ABSTRACT

A STUDY OF MAGNETIC RESONANCE IMAGING AND SPECTROSCOPY OF BRAIN IN CHILDREN WITH DEVELOPMENTAL DELAY

BACKGROUND:

Developmental delay denotes significant delay in one or more developmental domains. It has an estimated prevalence of 1-3% worldwide. Brain magnetic resonance imaging appears to be the most promising neuroimaging technique in the evaluation of patients with developmental delay.

AIMS AND OBJECTIVES:

Our study aims to identify the spectrum of abnormalities in brain magnetic resonance imaging in children with developmental delay and categorize the morphologic abnormalities. Secondly, the role of Proton Magnetic Resonance Spectroscopy (MRS) to ascertain the magnitude and severity of various neurometabolite ratios in children with normal brain imaging will also be studied.

MATERIALS AND METHODS:

Our study involves the evaluation of 100 children presenting with developmental delay to the Department of Radio diagnosis, Coimbatore Medical College Hospital between July 2015 and July 2016. The children were evaluated with a standard MRI protocol. Clinical and demographic parameters were noted. The various involved brain

structures were studied systematically and the morphologic abnormalities were categorized.

RESULTS:

The prevalence of abnormal MRI findings was 78% among the evaluated children. Our study showed predominant involvement of the white matter (50%), ventricles (37%) and corpus callosum (24%). The relative proportion of various morphologic abnormalities was Neurovascular diseases (50%), Congenital and developmental (12%), Non-specific findings (11%), Neoplastic and cystic lesions (3%) and combined etiology (2%). 10 children with a normal MRI were subjected to MR Spectroscopy which revealed no significant differance in the neurometabolite ratios amomg the patients.

CONCLUSION:

MR imaging has good sensitivity in diagnosing various disorders of developmental delay. Careful evaluation of the MRI helps identifying the probable etiology in most if not all cases. Proton MR Spectroscopy is an emerging technique in evaluating children with developmental delay and should be incorporated in the standard MRI protocol in cases where it is feasible. Hence, appropriate diagnosis on MRI helps in guiding the physician to plan further patient management.

KEY WORDS :

Developmental delay, children, magnetic resonance imaging, neurovascular diseases, magnetic resonance spectroscopy.