CLINICAL AND RADIOLOGICAL PROFILE OF FOCAL CORTICAL DYSPLASIA IN CHILDREN

Shikha Jain, Prateek Malik, Sangeetha Yoganathan, Karthik Muthusamy, Maya Mary Thomas

Christian Medical College, Vellore, Tamil Nadu, India

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INTRODUCTION

Focal cortical dysplasia are malformation of cortical development and various genetic and acquired caused are implicated in pathogenesis. After its first description by Taylor et al in 1971 and with ever advancing neuroimaging, more and more patients are diagnosed with focal cortical dysplasia. We present the MRI and clinical features of 67 patients diagnosed with focal cortical dysplasia based on imaging findings.

MATERIALS AND METHODS

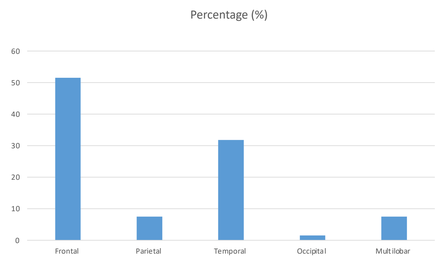
This is a descriptive study of children who visited epilepsy clinic and paediatric neurology clinic at a tertiary care hospital during year 2009 to 2018. A total of 67 Children from birth to 15 years of age with MRI confirmation of focal cortical dysplasia were included in the study. A retrospective chart review of medical records was done to collect the data. All patients had detailed MRI Brain epilepsy protocol study which included **T1** sequence (axial and coronal) FLAIR sequence (axial and angled coronal) inversion recovery sequences ,DWI/ADC, SWI or T2. MRI brain images were reviewed by trained neuroradiologist specialised in paediatric cases.

RESULTS

Sixty seven patients were included in the study for descriptive statistics. Out of these 59.7% (40/67) were males and 40.2 (27/67) were females. Family history of epilepsy was positive in 13.4% (9/67) of children. History of febrile seizure was present in 16.4 % (11/67) of children.

Developmental delay was noted in 16.4 % (11/67) of children. Among these 9 had global developmental delay while 2 had predominant language delay. Behavioral problems were noted in 8 children out of which 3 had autistic traits while hyperactivity was noted in 5 children. The median age of onset of seizure was 43.4 months (Range 3 days of life to 14 years). About 6% (4/67) of children had initial seizure during neonatal period and 38.8% (26/67) had initial seizure during infancy. Initial semiology was of focal onset in 73.1% (49/67) and generalized in 26.8% (18/67). Change in semiology of seizures was noted in 19.4% (13/67) of patients. 52.2% (35/67) children had daily seizures and 19.4% (13/67) had at least one event of status epilepticus.

Clear cut MRI features of FCD were noted in 76.2% (51/67) of cases. Remaining 23.8% (16/67) had subtle features of FCD on MRI which were confirmed on the basis of FDG-PET or ictal SPECT imaging.



Lobe wise distribution of focal cottical dysplasia

RESULTS

MRI feature		Precentage
Number of foci on MRI	Single focus	86.3
	>1 foci	13.6
Number of gyri involved in FCD	Single gyrus	66.6
	>1 contiguous gyri	33.3
Subcortical FLAIR hyperintense signal	Absent	74.3
	Present	25.7
Bottom and non bottom part involvement	Bottom part	12.2
	Non-bottom	09.1
	Bottom + non-bottom	78.7
Gray-white matter junction blurring (defined on T1 image	Absent	13.6
	Present	86.3
Cortical thickening	Absent	10.6
	Present	89.3
FLAIR hyperintense signal	Absent	27.2
	Present	72.7
T2 hyperintense Transmantle sign	Absent	65.1
	Present	34.8
T1 hyperintense Transmantle sign	Absent	95.5
	Present	04.4
% of gyrus involved	>50% 37	56.1
	<50% 29	43.9

DISCUSSION

In our cohort, we observed that focal cortical dysplasia occur more commonly in males and in approximately one third of patients, first seizure occurs in infancy. In around 50 percent of patients, seizures were refractory with daily occurrence. Frontal lobe is most commonly involved lobe in our cohort. Bottom and non-bottom part involvement, T1 blurring of grey-white matter junction, presence of flair hyperintense signal and cortical thickening was observed in approximately 2/3rd of the children.

CONCULSION

Identification of focal cortical dysplasia in MRI helps in early etiologic diagnosis and hence planning of epilepsy surgery. Ours was a historical cohort and histopathologic confirmation of the FCD was not done. More studies are required to correlate the MRI and histopathological findings with surgical outcome.

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