A CROSS SECTIONAL STUDY DONE TO DETERMINE THE PREVALENCE, DESCRIBE THE CLINICAL PROFILE AND IDENTIFY THE RISK FACTORS OF EPILEPSY IN CHILDREN WITH CEREBRAL PALSY (EPIC Study)

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ABSTRACT

Background:
Epilepsy is a common complication of cerebral palsy and occurs in about 15-60% of children with Cerebral palsy (CP).

Objectives:
To determine the prevalence of epilepsy, describe the clinical feature and identify the risk factors associated with presence of epilepsy in children with CP.

Materials and Methods:
439 consecutive children with CP aged between 1-15 years were recruited. Epilepsy was defined as occurrence of two unprovoked seizures 24 hours apart. Children with cerebral palsy who had epilepsy and those who did not have epilepsy were compared and analysed.

Association between epilepsy and the following were explored - history of neonatal seizures, socioeconomic status (assessed by modified Kuppusamy score), motor
function (assessed by Gross Motor Function score - GMFCS), nutritional status (assessed by the weight for age Z score of WHO Multicentre growth reference study (MGRS), head circumference (HC) (Z score of head based on WHO MGRS), Social adaptive quotient obtained on the Vineland Adaptive behaviour scales and presence of abnormal neuroimaging findings using the MRICS (MRI function classification for cerebral palsy)

**Results:**

There were 169 children with epilepsy and the prevalence of epilepsy in the cohort was 38.5% (33.9 to 43.2 95% CI). The median age of onset of epilepsy in our cohort was 9 months (mean of 15.6 months) and majority (67%) of the children had onset of epilepsy in the first year. More than two thirds of the children had microcephaly, short stature and malnutrition in this study. Microcephaly was more significantly associated with children with epilepsy (p<0.001) but short stature or malnutrition was not significantly different between the children with epilepsy and children without epilepsy. Perinatal and neonatal complications were the important causes of cerebral palsy (CP) in this study. The predominant type of CP was spastic CP and among the spastic CPs, quadriplegic CP was the most common. The highest frequency of epilepsy in this study was in those with quadriplegia (49%), followed by mixed CP (44%) and then hemiplegic CP (33%). History of neonatal seizure is significantly associated with occurrence of epilepsy in CP (p<0.001) Family history of epilepsy is significantly associated with development of epilepsy. In our study we had found 94.7% children among epilepsy group had SQ below 70 score, compared to 67.8% in the non-epilepsy group (p<0.001). The prevalence of epilepsy increased with
worsening of the GMFCS score (p<001)

Generalized seizures comprised 55%, myoclonic seizure (including infantile spasms) comprised 36% and partial seizure comprised 9% of the seizure patterns. Abnormal inter-ictal EEG was present in 68.6% of the children with epilepsy. Nearly half (46%) of the total patients with epilepsy had generalized epileptiform activities, 17% had focal epileptiform activities and hypsarrhythmia was observed in about 5%. The remaining 31.4% had normal EEG. Seizures were controlled in 124 children (73.4%)

Factors significantly (p<0.05) associated with poor seizure control were non-ambulant status (if the GMFCS score was 3 and above), abnormal EEG findings and polytherapy. Among the children who had MRI the predominant lesions were periventricular leukomalacia (36%), basal ganglia and thalamic lesions (23.8%) cortical and sub-cortical lesions (17.5%) and malformations (4.6%). Presence of certain co-morbidities namely visual impairment, swallowing difficulties and drooling and the presence of autistic symptoms were significantly higher in the children with epilepsy.

Conclusions:

Epilepsy is a common complication of CP and should be anticipated when there is history of neonatal seizures, microcephaly, poor social quotient or significant motor disability. Early identification and treatment may help in better control of seizures and improving the quality of life in CP children.

Keywords: Cerebral palsy, Epilepsy, Motor disability, Neonatal seizures, Risk factors