



ASSOCIATION OF MESIAL TEMPORAL SCLEROSIS IN SIMPLE FEBRILE CONVULSION ADMITTED TO TERTIARY CARE CENTRE

Paediatrics

Dr. Chikkanarasa Reddy P S

Associate Professor in Pediatrics, Bangalore Medical College and Research Institute, K R Road, Fort, Bangalore-560002.

Dr. M Kavitha*

Post Graduate in Paediatrics, Bangalore Medical College and Research Institute, K R Road, Fort, Bangalore-560002. *Corresponding Author

ABSTRACT

Febrile convulsion is defined as convulsion occurring in children aged 6 months to 5 years in association with febrile illness in the absence of central nervous system infection or acute electrolyte abnormalities without any prior afebrile seizures. Peak age incidence is 18-24 months. One of the most controversial issue is whether febrile convulsion causing mesial temporal sclerosis or preexisting mesial temporal sclerosis is leading to febrile convulsion. Data is collected from the children admitted to our hospital with simple febrile convulsion from February 2021 to august 2022. Children after initial stabilization will be taken to MRI brain. As there are no studies on imaging in simple febrile convulsion our study conducted. A total number of 35 children were enrolled in our study. Majority of these children were 12-24 months (10 children). M:F ratio 1.3:1. Majority of children had GTCS type of convulsion. 20% children had anemia. Out of 35 children 4 children had mesial temporal sclerosis. Out of 4 mesial temporal sclerosis children 3 had recurrent episodes febrile convulsions. There is no association between mesial temporal sclerosis in simple febrile convulsion. But follow up study can be taken in these children as mesial temporal sclerosis was seen in those children with recurrent episodes of simple febrile convulsion. Hence MRI brain can be considered in recurrent simple febrile convulsion.

KEYWORDS

Febrile convulsion, mesial temporal sclerosis, recurrent simple febrile convulsion.

INTRODUCTION

Febrile convulsion is defined by International League against Epilepsy¹ as convulsion occurring in association with febrile illness in the absence of central nervous system infection or acute electrolyte imbalance in children aged 6 months to 5 years. Febrile convulsions are the most common form childhood convulsions in United States occur in 2-4%, in Japan 9-10%. In India 3.28-5.71/1000. Peak age incidence is 18 months-24 months. Febrile convulsions are further classified² as simple and complex febrile convulsions. Simple febrile convulsions are one which are generalized convulsion lasting less than 15 mins and occurring only once in 24 hours, isolated and brief convulsion. Complex febrile convulsions are focal prolonged (lasting for either 10 or 15 mins). 90% of convulsion occur within first 3 years.

Mesial temporal sclerosis (MTS) is a condition characterized by scarring and deterioration of the inner part of the brain's temporal lobe. MTS is the most common cause of temporal lobe epilepsy. Follow-up of children with febrile convulsions does not demonstrate a significantly increased incidence of temporal lobe epilepsy³. MTS is the most common cause of temporal lobe epilepsy.

One of the most controversial issue is whether febrile convulsions cause mesial temporal sclerosis or preexisting mesial temporal sclerosis which is causing febrile convulsions⁴. Imaging studies have shown that prolonged and focal febrile convulsions can produce acute hippocampal injury that evolves in to hippocampal atrophy. There is evidence that febrile convulsion is associated with an increased risk of subsequent epilepsy in 2-4% of children⁵.

MRI Finding seen in children with febrile status epilepticus⁶ and in complex febrile convulsion is well known but there are no studies for MRI in simple febrile convulsion. In this study we are proposing MRI in Simple Febrile convulsion and predisposition to future temporal lobe intractable epilepsy, in a child with mesial temporal sclerosis.

METHODOLOGY

After Institutional ethical clearance. Children who fulfill the inclusion/exclusion criteria for the study were selected. Informed and written consent was obtained from parents of all cases. All enrolled children were taken detailed clinical history including age at first onset of febrile convulsion, number of episodes of convulsion/year, duration of convulsion, type of convulsion, family h/o febrile convulsion, any h/o additional clinical feature and general physical examination finding were recorded on a pre designed proforma. Systemic examination finding was also recorded. After conservative management for fever and convulsion children were taken to MRI Brain that is within 48-72 hours of admission. MRI Brain done using MRI Brain Epilepsy protocol. It is an observational cross-sectional study conducted from

February 2021 to August 2022 in Department of Pediatrics, Vani Vilas Hospital, BMCRI, Bangalore.

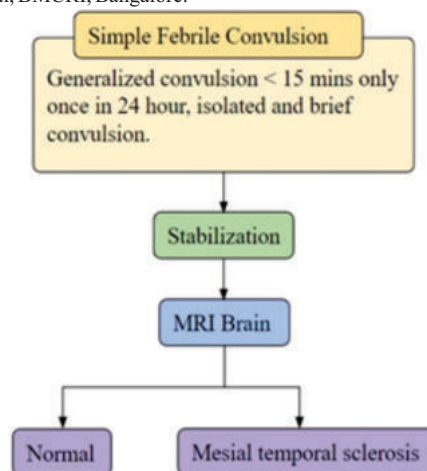


Figure 1: Overall methodology of the current study

RESULTS

A total number of 35 children were enrolled in our study. Majority of these children were 12-24 months (10 children). Male children were affected more than female children with M:F ratio 1.3:1. Maximum number children had GTCS type of convulsion lasting less than 10 minutes. 20% children had additional finding of anemia. Out of 35 children 4 children had mesial temporal sclerosis. Out of 4 mesial temporal sclerosis children 3 had recurrent episodes febrile convulsions.

Gender Distribution		
	Frequency	Percent
Male	20	57.1
Female	15	42.9
Total	35	100.0

Figure 2. Sex Distribution

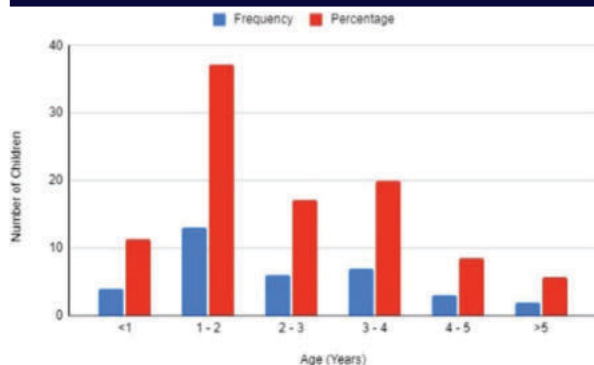


Figure 3. Age Distribution

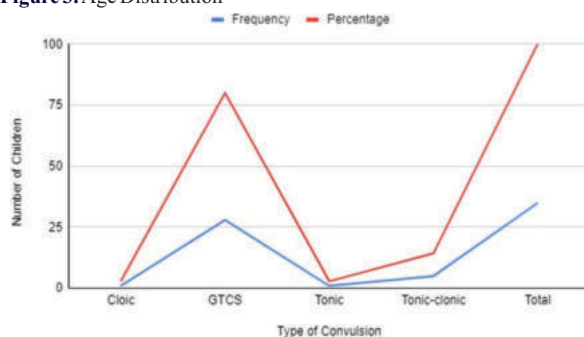


Figure 4. Distribution of type of convulsion

MRI Report		
	Frequency	Percent
Mesial temporal sclerosis	4	11.4
Normal	31	88.6
Total	35	100.0

Figure 5. Distribution o subject based on MRI report

DISCUSSION

Febrile convulsions are one of the common pediatric emergencies encountered around the world. Febrile convulsions occur in 6 months to 5 years of age. Incidence of febrile convulsions around the world is between 3-4%. It is of similar incidence all over the world. At least 3-4 % children may have one episode below 5 years of age. In India, incidence is almost 10% according to some studies. But recent studies indicate that incidence is almost comparable to western population⁷.

Various mechanisms like genetic factors, family history of febrile convulsions, deficiency of Iron and zinc were proposed. Various studies showed that deficiency of Iron and zinc as risk factors for development of convulsions.

There are studies on a prolonged febrile convulsion cause mesial temporal sclerosis and future intractable temporal lobe epilepsy. Early Febrile convulsion damages the hippocampus and is therefore cause of mesial temporal sclerosis. MTS is the most common cause of temporal lobe epilepsy^{8,9,1}.

Another possibility is that the child has prolonged febrile convulsions because the hippocampus was previously damaged by a prenatal or perinatal insult or by a genetic predisposition. Our study was taken up to see whether there is any preexisting brain pathology like MTS which is causing febrile convulsion or mesial temporal sclerosis is a later event which develop after prolonged or recurrent episodes of febrile convulsion. Our study conducted in Vani Vilas hospital out of 35 subjects enrolled in study 4 subjects had mesial temporal sclerosis with bilateral loss of hippocampal volume and also mild atrophy of hippocampus. Of the 4 positive MRI report of subjects, MTS was present in 3(75%) cases who had recurrent episodes of febrile convulsion and on the other side 1 child had MTS who presented with 1st episode of febrile convulsion.

Our study outcome measures are normal MRI Brain report in study

people indicates good outcome in children with simple febrile convulsions and they do not develop temporal epilepsy in later life. In our study 31(88.57%) cases had Normal MRI Brain report indicating good outcome measures in these children and they do not develop temporal lobe epilepsy in future. In our study there is no association of MTS in simple febrile convulsion with p value 0.068 statistically insignificant.

CONCLUSION

There is no association between mesial temporal sclerosis in simple febrile convulsion. But follow up study can be taken in these children as positive finding were seen in those children with recurrent episode of simple febrile convulsion. Hence MRI Brain can be considered in Recurrent simple febrile convulsion. Normal MRI Brain report indicating good outcome measures in these children and they do not develop temporal lobe epilepsy in future.

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