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AFEBRILE SEIZURES;

FREQUENCY OF HYPOCALCEMIA IN CHILDREN PRESENTING WITH AFEBRILE SEIZURES.

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ABSTRACT… Background: Seizures are the most common neurologic emergency in pediatrics and can be terrifying for patients and families. They occur in approximately 4-10% of children and account for 1% of all emergency department visits. There are a variety of potential causes for seizures; however, they have a final common pathway which includes abnormal electrical discharges of neurons. The extent of this abnormal discharges and their location in the brain leads to a variety of clinical presentation which range from subtle, non-convulsive events to dramatic generalized convulsions. Most common biochemical abnormality causing seizures is hypocalcemia, which in children may manifest astetany, seizures, muscle cramp, and paresthesia. **Objectives:** The objective of the study was to: determine the frequency of hypocalcaemia in children presenting with afebrile seizures from age 2 months to 2 years. **Study Design:** Descriptive cross sectional study. **Settings:** Pediatric emergency and outpatient department of Pediatric Medicine Unit 1, Independent University Faisalabad. **Period:** Six months from 01.01.2018 to 30.06.2018. **Methodology:** After Approval from Ethical committee, 86 children presenting in pediatric emergency of Independent Hospital Faisalabad who meet the inclusion criteria were enrolled in this study. Detailed history and informed consent was obtained from parents of each patient presenting with first episode of afebrile seizure. Blood serum sample was sent to the hospital pathology laboratory for assessment of serum calcium. Routine investigations to rule out other causes of seizures were also done. All the data was recorded on a predesigned performa. Inclusion and exclusion criteria were strictly followed. **Results:** In this study, out of 86 cases, 55%(n=47) were between 2-12 months of age and 45%(n=39) were between 13-24 months of age, mean+sd was calculated as 12.33+5.27 months, maternal age shows that 72.24%(n=58) were between 18-30years of age and 30.76%(n=29) were between 31-45years of age, mean+sd was calculated as 29.52+3.70 years, 52.38%(n=44) were male and 47.62%(n=42) were females, frequency of hypocalcaemia in children presenting with afebrile seizures from age 2 months to 2 years was recorded in 66.48%(n=56) cases. **Conclusion:** We concluded that the frequency of hypocalcaemia is higher in children presenting with afebrile seizures from age 2 months to 2 years, and by controlling hypocalcemia, we may reduce the risk of seizures.

Key words: Afebrile Seizure, Children, Hypocalcemia, Vitamin-D deficiency.

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INTRODUCTION

Seizures are very common and frequent among paediatrics emergencies. These fits are due to irregular, repetitive motor activity caused by disturbed electrical activity in brain.

Nearly 15%[1-2] of pediatrics emergencies and outdoor clinics having seizures with a without fever. These fits are were common under five year of age but maximum incidence is between 18 months 3 year of age[4] 5-7 % of children having one episode of fits before 14year.[6] Delayed birth cry, metabolic derangements, meningitis Encephalitis. febrile fits are common causes. Hypocalemia and Hypoglycemia are very common in premature and important cause of neurological delay and cognitive impairment 30%[5-7] of cause having A febrile fits due to hypocalcaemia cause may be prematurity, birth asphyxia, exogenous phosphate, and magnesium

deficiency, malablsorption, malnutrition and Vit D deficiency[10], Serum level of calcium are decreased with normal or increased phosphate.

Widely open anterior fontanels, late eruption of teeth[9-11], generalized hypotonia short strature are signs of calcium and Vit-D deficiency 30% of children having hypocalcaemic fits in their first year of life.

Objective behind this study is to know the frequency of hypocalemic fits very limited data is available. This study help us in determining bench mark for management and importance of Vit-D and calcium level for hypocalcemic a febrile fits.

MATERIALS AND METHODS

Study Design
Descriptive cross sectional study.

Settings
Pediatric emergency and outpatient department of Pediatric Medicine Unit 1, Independent Hospital Faisalabad.

Duration of Study
Six months after approval of synopsis from 01.01.2018 to 30.06.2018.

Sampling Techniques
Non probability consecutive sampling.

Sample Size
By using WHO sample size calculator, 86 children with afebrile seizure were included in the study
P: 68.3 %[2]
Margin of Error: 10%
Level of Confidence: 95%
Sample size: 86

Inclusion Criteria
Children with no previous active disease and with normal weight for age of 2 months to 2 years age presenting with first episode of afebrile seizure as per operational definitions were included in the study.

Exclusion Criteria
Children with previous history of birth asphyxia, hydrocephalus, and CNS infection like meningitis, encephalitis; or any chronic renal disease.

Children with history of recent intake of calcium and vitamin D supplements.

DATA COLLECTION PROCEDURE
After approval of synopsis, 86 children presenting in pediatric emergency of Allied Hospital Faisalabad who meet the inclusion criteria were enrolled in this study. Detailed history and informed consent was obtained from parents of each patient presenting with first episode of afebrile seizure. Blood serum sample was sent to the hospital pathology laboratory for assessment of serum calcium. Routine investigations to rule out other causes of seizures were also done. All the data was recorded on a predesigned performa. Inclusion and exclusion criteria were strictly followed.

DATA ANALYSIS PROCEDURE
All the collected data was entered into SPSS version 21. For quantitative variables like age, maternal age and serum calcium level, height, weight mean ± SD was calculated. For qualitative variables, gender, hypocalcaemia history of prematurity, LBW, parity, maternal anemia (Hb level <10mg/dL) present or not, frequency and percentage were calculated. Effect modifiers like age and gender, height, weight, history of prematurity, LBW, parity, maternal anemia was controlled by stratification. Post stratification chi-square test was applied and p value < 0.05 was taken as significant.

RESULTS
A total of 86 cases fulfilling the inclusion/exclusion criteria were enrolled to determine the frequency of hypocalcaemia in children presenting with afebrile seizures from age 2 months to 2 years.

Age distribution of the patients was done, it shows that 55%(n=47) were between 2-12 months of age and 45%(n=39) were between 13-24 months of age, mean+sd was calculated as 12.33+5.27 months. (Table-I)

Maternal age shows that 72.24%(n=58) were between 18-30years of age and 30.76%(n=29) were between 31-45years of age, mean+sd was calculated as 29.52+3.70 years. (Table-II)

Other characteristics of the patients was recorded as 33.29%(n=33) with maternal anemia, history of prematurity was recorded in 30.95%(n=26), low birth weight was found in 2.86%(n=36) and parity between 1-3 was in 58.33%(n=49) and >3 parity was recorded in41.67%(n=35). (Table-III)

Mean weight of the patients was calculated as 8.5+4.24 kgs, height was 29.81+7.81cm and serum calcium levels were calculated as 7.39+2.41 mg/dl. (Table-IV)

Frequency of hypocalcaemia in children presenting with afebrile seizures from age 2 months to 2 years was recorded in 65.48%(n=56) cases while 34.52%(n=30) had no findings of this morbidity. (Table-V)

Gender distribution shows that 52.38%(n=44) were male and 47.62%(n=42) were females. (Table-VI)

Effect modifiers like age and gender, height, weight, history of prematurity, LBW, parity, maternal anemia was controlled by stratification. Post stratification chi-square test was applied and p value < 0.05 was taken as significant. (Table-VII,VIII)

Age (in Months)	No. of Patients	%
2-12	47	55
13-24	39	45
Total	86	100
Mean+SD	12.33+5.27	

Table-I. Age distribution (n=86)

Age (in Years)	No. of Patients	%
18-30	58	72.24
31-45	28	30.76
Total	86	100
Mean+SD	29.52+3.70	

Table-II. Maternal age (n=86)

Characteristics		No. of Patients	%
Maternal anemia	Yes	33	39.29
	No	51	60.71
History of prematurity	Yes	26	30.95
	No	58	69.05
Low birth weight	Yes	36	42.86
	No	48	57.14
Parity	1-3	49	58.33
	>3	35	41.67

Table-III. Other characteristics of the patients (n=86)

	Mean	SD
Weight(kgs)	8.54	4.24
Height(cm)	29.81	7.18
Serum calcium level (mg/dl)	7.39	2.41

Table-IV. Mean Height, Weight and serum calcium levels (n=86)

Hypocalcemia	No. of Patients	%
Yes	56	66.48
No	30	33.52
Total	86	100

Table-V. Frequency of hypocalcaemia in children presenting with afebrile seizures from age 2 months to 2 years (n=86)

Gender	No. of Patients	%
Male	42	52.38
Female	44	47.62
Total	86	100

Table-VI. Gender distribution (n=86)

Age (in Months)	Hypocalcaemia		P-Value
	Yes	No	
2-12	30	12	0.25
13-24	25	17	
Gender			
Male	31	28	0.001
Female	24	1	
Maternal Age			
18-30	39	20	0.85
31-45	16	9	

Table-VII. Stratification for frequency of hypocalcaemia in children presenting with afebrile seizures from age 2 months to 2 years with regards to age & gender

Characteristics		Hypocalcemia		P-Value
		Yes	No	
Maternal Anemia	Yes	27	6	0.01
	No	28	23	
History of Prematurity	Yes	20	6	0.13
	No	35	23	
Low Birth Weight	Yes	31	5	0.0006
	No	24	24	
Parity	1-3	26	23	0.0004
	>3	29	6	

Table-VIII. Stratification for frequency of hypocalcaemia in children presenting with afebrile seizures from age 2 months to 2 years with regards to other characteristics (n=84)

DISCUSSION

Among neurological emergencies seizures are very common and putting lot of emotional burden and stress for families and patients, 5-9 % of children are suffering from seizures. Abnormal electrical discharge from any port of brain is important cause of fits varying from subclinical to fulflag generalized tonic clonic fits. Hypocalcaemia is one of very important cause of fits, tetany and muscle cramps.

This study is conducted to determine the frequency of hypocalcaemic fits as a cause of fits without fever. This study help us know the burden and setting bench marks for future planning about calcium and vit-D supplementation.

Study done by[12] alber et al repented that 65% children having fever free fits which support our results. Binmahana et[13] al also report 72.2% a febrile hypocalcaemia fits.

In developing countries urban referral hospital having lot of patients with A febrile fits caused by hypocalcaemic.[14-15]

Cetinkaya document that this hypocalcaemia is associated with nutritional intake of calcium and other micro and macronutrient Deficiencies.[16]

Humayun et al conduct a study which shows that low socioeconomic, maternal education, exposure to sunlight and large family size are important risk factor for vit-D Deficiencies.[17]

This study is conducted to determine the frequency of hypocalcaemic fits as a cause of fits without fever. This study help us know the burden and setting bench marks for future planning about calcium and vit-D supplementation.

CONCLUSION

We concluded that the frequency of hypocalcaemia is higher in children presenting with afebrile seizures from age 2 months to 2 years, and by controlling hypocalcemia, we may reduce the risk of seizures.

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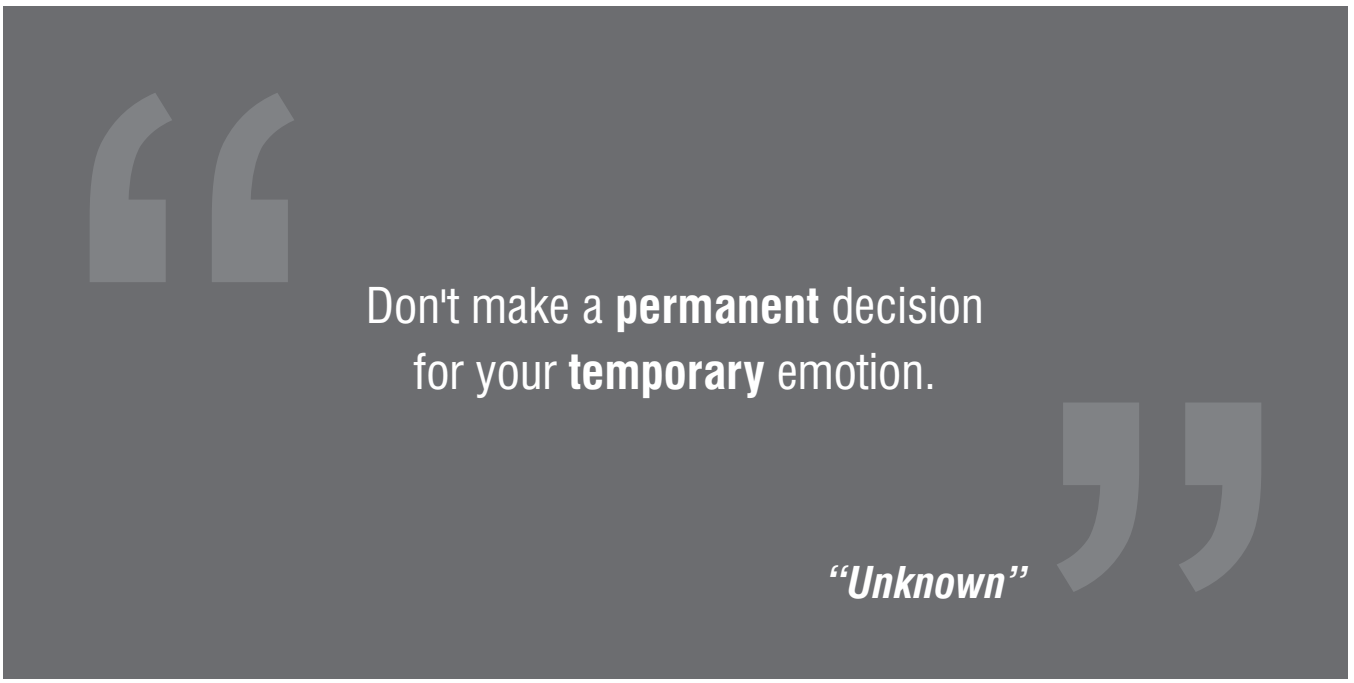

AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Mahwash Rehman	Data collection.	
2	Fazal Ellahi Bajwa	Data collection, Statistical analysis.	
3	M. Aamer Mushtaq	Interpretation of data, Discussion.	
4	Imran Sarwar	Data analysis.	
5	Sadida Amir	Discussion.	
6	Rashid Nawaz	Statistical analysis.	