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Zinc Levels In Febrileseizure Children From 6 Months To 5 Years In A Tertiary Care Centre - Observational Prospective Study

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I. Introduction

Febrile seizures are the seizures that occur between the ages of 6 months to 60 months with a fever spike of 38 degree Celsius or higher that are not the result of CNS infections or any metabolic imbalance and that occur in the absence of history of prior afebrile seizures. A simple febrile seizure is a primary generalized tonic clonic attack associated with fever lasting for less than 5 minutes and not recurrent within a 24 hour period

Recurrence of febrile seizure is common and causes for recurrence includes age less than 1 year, unrecognized high fever spikes, incompliance of clobazam. Educating and counseling of parents about the condition is important.

The presence of zinc in synaptic vesicles suggests that the metal may have additional, unique signaling roles within the central nervous system. Importantly, the localization and content of this vesicular or synaptic zinc pool can rapidly change as a result of sensory experience suggesting that neuronal zinc signaling undergoes experience-dependent plasticity. At rest, both intracellular and extracellular labile zinc levels are maintained at nanomolar or sub nanomolar concentrations .

Following synaptic zinc release, extracellular zinc levels transiently increase to modulate neurotransmission . Moreover, activity can trigger large transient increases in intracellular zinc that initiate diverse cellular signaling. Under physiological conditions, these changes in zinc concentration in and out of cells are tightly regulated to prevent neuronal death that occurs with zinc dysregulation .

The best characterized modulatory action of zinc is its inhibition of NMDARs. Initial studies found that exogenous application of micromolar concentrations of zinc inhibited NMDAR currents.

II. Aim And Objective

To assess the serum zinc levels in febrile seizure children between the ages of 6 months to 60 months in a tertiary care centre

Study design : Prospective observational study

Study place: ACS medical college and hospital)

Study period: 1 year (august 2023 to august 2024)

Sample size: 150

Inclusion Criteria: Children in a age group of 6months to 60 months presenting with first episode of febrile seizure admitted in A.C.S Medical college and hospital.

Exclusion Criteria:
1. Seizure disorder

2. Neurodevelopmental delay
3. Complex febrile seizure
4. Status eplilepticus
5. Acute and chronic CNS infections
6. Children on zinc supplementation

III. Methodology

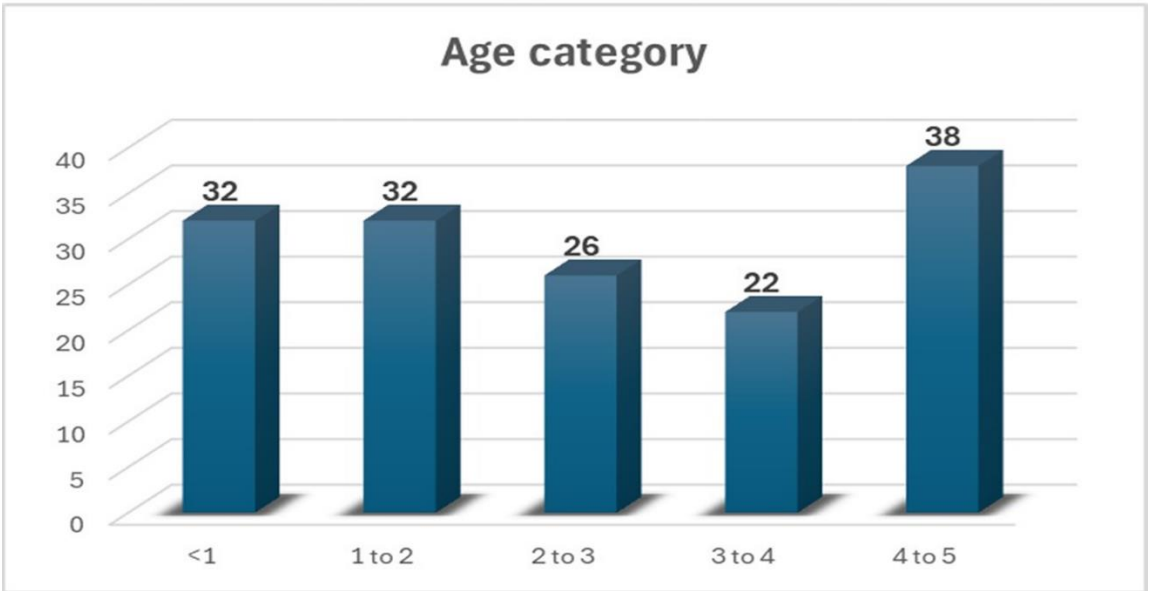
The study was conducted in ACS Medical college and hospital , Chennai, India. 150 children presented with febrile seizure were included in the study. Zinc levels were measured by sending venous sample to the laboratory through atomic absorption spectrophotometry.

Statistical Analysis Plan

Data was entered in excel and analyzed using SPSS version28.0. All the categorical variables were described in frequency and percentage and quantitative variables were described in Mean +- SD. Association between the quantitative variables were done using Chi square analysis and if any cell value is less than 5, Fishers Exact test is used. P-value

IV. Results

Chart 1: Distribution of children according to their Age category



RESULTS

Table 1: Distribution of children according to their Age category

Age category	Frequency	Percentage
<1	32	21.3
1 - 2	32	21.3
2 - 3	26	17.4
3 - 4	22	14.7
4 - 5	38	25.3
Total	150	100.0

Table 2: Distribution of children according to their Gender

Gender	Frequency	Percentage
Male	98	65.3
Female	52	34.7
Total	150	100.0

Chart 2: Distribution of children according to their Gender

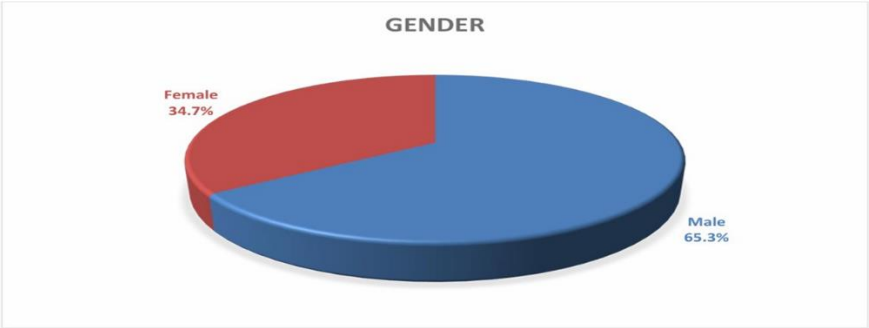


Table 8: Distribution of children according to Serum Zinc Level

Serum Zinc Level	Frequency	Percentage
Normal	133	88.7
Decreased	17	11.3
Total	150	100.0

Chart 8: Distribution of children according to Serum Zinc Level

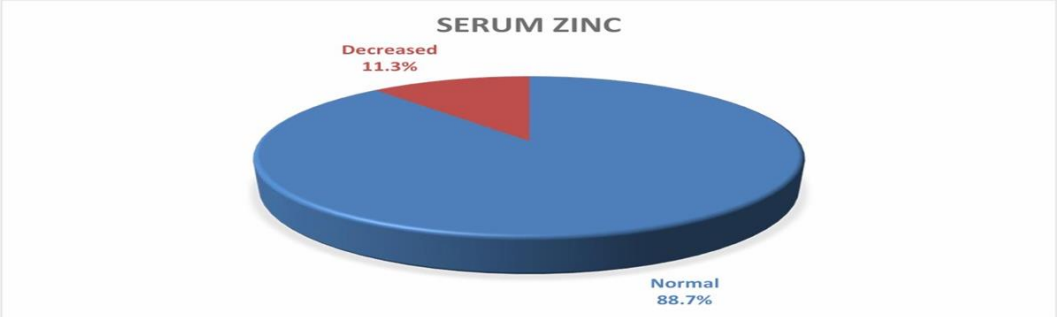
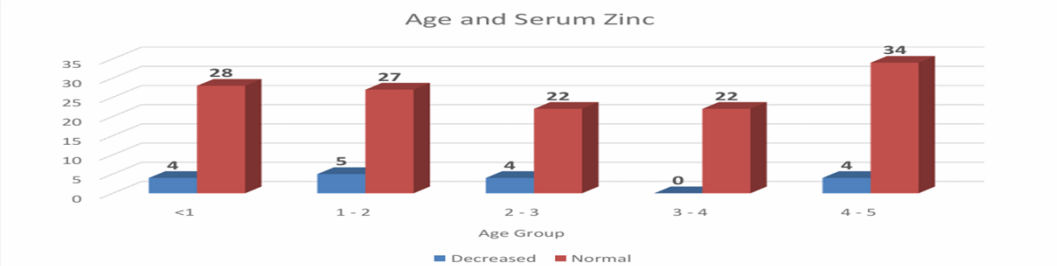


Table 14: Association between Age and Serum Zinc

Age group		Serum Zinc		Total	p-value
		Decreased	Normal		
<1	n	4	28	32	0.353
	%	12.5%	87.5%	100.0%	
1 - 2	n	5	27	32	
	%	15.6%	84.4%	100.0%	
2 - 3	n	4	22	26	
	%	15.4%	84.6%	100.0%	
3 - 4	n	0	22	22	
	%	0.0%	100.0%	100.0%	
4 - 5	n	4	34	38	
	%	10.5%	89.5%	100.0%	
Total	n	17	133	150	
	%	11.3%	88.7%	100.0%	

Chart 14: Association between Age and Serum Zinc



V. Conclusion

In our study, zinc levels were observed in febrile seizure children from 6 to 60months of age .

Male children are more prone to febrile seizures according to the study showing that 65.3%were males and 34.7%were females

Zinc levels were reduced in 11.3 percent only, and remaining children were not zinc deficient, hence statistically not significant.

Furthermore number of sample and studies may be needed to know whether hypozincemia causes febrile seizures

According to WHO, zinc supplementation is ideal and necessary for febrile seizure children.

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