

To Determine The Frequency Of Iron Deficiency Anemia As A Risk Factor For Simple Febrile Seizures Presenting To The Department Of Pediatrics, Gomal Medical College, D.I. Khan

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Abstract

Background: In children Febrile Seizures one of the most common pediatric emergency. Iron deficiency anemia is one of the risk factors for febrile seizures. Iron deficiency anemia is a treatable and preventable disease. This study will acquaint local researchers in managing both these diseases in a much pragmatic manner at the local level.

OBJECTIVE: To determine the frequency of Iron deficiency anemia as a risk factor for simple febrile seizures in children presenting to Gomal Medical College, D.I. Khan.

Study Design : A Descriptive Cross sectional study.

Place and Duration of Study. Pediatric department Gomal Medical College, D.I. Khan after approval from institutional ethical review board from 01 Nov 2020-01 Apr 2021

SUBJECTS AND METHODS: This Descriptive cross sectional study was carried out in Pediatric department Gomal Medical College, D.I. Khan after approval from institutional ethical review board from 01 Nov 2020-01 Apr 2021. Total 185 children suffering from febrile seizures with ages between 6 months-6 years from both gender were enrolled after informed consent from parents and guardians. Purposive sampling was done to measure hemoglobin, MCHC, MCV and serum ferritin and Iron Deficiency Anemia was diagnosed as per operational definition. Data was collected on pre-designed structured performa and was analyzed using SPSS version 23.

RESULTS: As per frequencies and percentages for iron deficiency anemia in patients presented with febrile seizures, 70 (37.8%) patients were recorded with iron deficiency anemia.

CONCLUSION: This study found that iron deficiency is a major risk factor for simple febrile seizures in children under the age of three.

KEYWORDS: Iron Deficiency Anemia, Febrile Seizers, Children.

INTRODUCTION:

Febrile seizure is the most common emergency affecting 2-5% of children between 6 months-60 months with peak age incidence at 14-18 months¹. It is defined as seizures occurring at temperature more than 100.4 degree F in absence of central nervous system infection, absence of electrolyte abnormalities and no previous history of afebrile seizures². The cause of febrile seizures seem to be multifactorial. Febrile seizures are classified into two types: simple and complex febrile seizures. In simple febrile seizures, the seizures are generalized tonic clonic, occurring less than 15 min and do not reoccur within 24 hr period¹. Iron deficiency affects one third of the world population so its one of the most common nutrient deficiency². 50% of young children in developing countries suffer from anemia and among them most common is iron deficiency anemia (50%) in these children^{3,4}. In Pakistan, iron deficiency anemia affects 65% of children³. It might be due to inadequate dietary iron, poor iron absorption, hemorrhage, or bodily iron loss in the urine⁴. Iron deficiency cause multiple effects in children like behavioral disturbances, abnormal growth, impaired cognition and immune dysregulation^{5,6}. Its deficiency also affects neuronal excitability due to reduction in levels of

certain neurotransmitters like monoamine oxidase and aldehyde oxidase. Iron also plays an important role in myelination of neurons which is important for neurotransmission⁷. Iron deficiency anemia can be prevented and treated. The objective of study is to find out iron deficiency anemia as risk factor for febrile fits. The relationship between iron deficiency anemia and febrile seizures has not been researched much despite the facts mentioned above. There is a considerable overlap in the peak incidence age of febrile seizures and iron deficiency anemia. This point towards a need to explore the frequency of iron deficiency anemia amongst febrile seizures so that this study acquaint local researchers in managing both these diseases in a much pragmatic manner at the local level.

MATERIALS AND METHODS:

This Descriptive cross sectional study was carried out in Pediatrics Department of Gomal Medical College DI Khan from 1st November, 2020 to 1st April, 2021. Total 185 children between 6 months to 60 months from both gender were taken with no detectable CNS infection like meningitis, electrolyte abnormalities and no previous history of afebrile seizures. The hemoglobin, MCHC, MCV and serum ferritin was measured and recorded on pre-designed structured performa. Data was analyzed using SPSS version 23.0. Mean + SDs was calculated for quantitative variables for age, hemoglobin, MCHC, MCV and serum ferritin. Frequencies and percentages were calculated for gender and Iron Deficiency Anemia. Iron Deficiency Anemia was stratified with age and gender in order to see effect modifiers. Post stratification chi square test was applied keeping P Value < 0.05 as significant. All results were presented in the tabulated form.

RESULTS:

Mean and Standard Deviation for age was 2.16±0.98 years. Mean and Standard Deviation for Hb level was 10.32±2.08mg/dl. Mean and Standard Deviation for MCV level was 70.63±13.5fl. 170 (91.9%) patients were ≤3 year age while 15 (8.1%) patients were >3 years age. 119 (64.3%) male patients and 66 (35.7%) female patients were recorded. As per frequencies and percentages presented with febrile seizures 70 (37.8%) patients were recorded with iron deficiency anemia.

Table 01: Descriptive Statistics of Study (n=185)

| Continuous variables | Mean | Std. Deviation |
|----------------------|--------|----------------|
| Age(Years) | 2.16 | .987 |
| Hb Level(g/dl) | 10.325 | 2.0811 |
| MCHC(g/dl) | 29.78 | 4.033 |
| MCV(fl) | 70.63 | 13.516 |

Table 02 : AGE WISE DISTRIBUTION(n=185)

| Age Groups | Frequency | percentage |
|------------|-----------|------------|
| <3yr | 170 | 91.9% |
| >3yr | 15 | 8.1% |
| Total | 185 | 100% |

Table 03: GENDER WISE DISTRIBUTION (n=185)

| Gender | Frequency | percentage |
|--------|-----------|------------|
| Male | 119 | 64.3% |
| Female | 66 | 35.7% |
| Total | 185 | 100% |

Table 04 : FREQUENCY AND PERCENTAGES FOR IRON DEFICIENCY ANEMIA

(n=185)

| Iron Deficiency Anemia | Frequency | Percentage |
|------------------------|-----------|------------|
| Yes | 70 | 37.8% |
| No | 115 | 62.2% |
| Total | 185 | 100% |

Table 05: FREQUENCIES AND PERCENTAGES FOR IRON DEFICIENCY ANEMIA

(n=185)

| | | Age Groups | | Total | P value |
|------------------------|-----|------------|---------|-------|---------|
| | | <3 year | >3 year | | |
| Iron Deficiency Anemia | Yes | 61 | 9 | 70 | 0.065 |
| | | 35.9% | 60% | 37.8% | |
| | No | 109 | 6 | 115 | |
| | | 64.1% | 40% | 62.2% | |
| Total | | 170 | 15 | 185 | |
| | | 100% | 100% | 100% | |

DISCUSSION:

In pediatric practice, febrile seizures is the most common seizure disorder in children under 5 year age, quite benign but terrifying for the parents and children. Febrile seizures are age dependent. Mean and SD for age was 2.16 ± 0.98 years which is in accordance with the age of 24 month in study done by Khan SA et al³. Majority of patients (91.9%) were ≤ 3 year age which is similar to study done by Surani MK. Iron deficiency anemia is more common in this age group because of certain factors like delayed weaning, low socioeconomic status and poor knowledge of mothers leading to inadequate nutrition of children increasing the risk of various infectious diseases and also febrile seizures. In this study we found that iron deficiency anemia is more common in males (64.3%) as compared to females (35.7%)

which is similar to study done by SA Khan in which males were also dominant(59.44%) and also in study done in India by Saleem² where percentage of males were 64%.In this study among children with febrile seizures,Mean hemoglobin level(10.3g/dl),Mean MCV(70.63),Mean MCHC(29.78) were lower as compared to healthy children age group.These values are similar to studies carried out by Bakkannavar S etal⁸ and Gaballah PW etal⁹.In our study,iron deficiency anemia was reported in 70(37.8%) patients who presented with simple febrile seizures which is similar to study carried out by Surani MK where iron deficiency anemia was observed in 28.1% of children.Iron deficiency can alter brain synaptic neurotransmitters,which may be responsible for induction of seizure due to iron deficiency

CONCLUSION:

This study demonstrated that iron deficiency has got significant risk for simple febrile seizures in children below 3 years of age so early diagnosis and supplementation of iron may be helpful in order to prevent febrile seizures but also play an important role in behavioral and neurological development of children.

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Authors Contribution

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