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Research Article

EFFECTIVENESS OF IRON SUPPLEMENTATION TO MANAGE BREATH HOLDING SPELLS AMONG CHILDREN WITH RESPECT TO FERRITIN & HEMOGLOBIN LEVELS

¹Dr. Syed Ubaid Hasnain, ²Dr. Waqas Akhtar, ³Dr. Sidra Zaheer¹Pakistan Institute of Medical Sciences (PIMS), Islamabad.**Abstract:****Objectives:** We aimed to determine the occurrence of iron deficiency anaemia among children having spells of breath holding.**Methodology:** We conducted this research at Services Hospital, Lahore in the timeframe of November 2016 to August 2017 on a total of ninety-five children of breath holding spells as they fulfilled the inclusion criteria and after agreeing to research protocols by extending their informed consent. Ethical permission of the hospital was also taken before the research commencement. We explained the objective and aim of the research to research participants and their parents/guardians. We strictly observed inclusion criteria and all those not fulfilling the research enrolment criteria were excluded. A thorough examination of children and detailed medical history was documented on a pre-designed Proforma. We drained a blood sample of (3 cc) for the evaluation of the level of serum ferritin and complete blood count in the laboratory of the hospital along with the assessment of iron deficiency anaemia.**Results:** The age wise distribution of 95 patients was such as 58 children were in the age bracket of (6 – 36) months with a proportion of (61.05%); whereas, 37 children were in the age bracket of (37 – 60) months with a proportion of (38.95%). The mean age of the children was (38.74 ± 11.98) months. Gender distribution was such as 56 children were male (58.95%) and remaining 39 were female (41.05%). Iron deficiency anaemia morbidity was present among 49 children (51.58%); whereas, it was absent among 46 children (48.42%).**Conclusion:** Iron deficiency anaemia occurrences were higher among breath holding spells children. However, its management is easy and accessible because of effective and economic iron supplements. These supplements are able to control anxiety. Improved and better outcomes of iron supplements also reduce extra expenditure and fatigue factor of patients and their parents/guardians as there is no such requirement of medical or clinical investigations and reduced hospital visits.**Keywords:** Breath Hold Spells, Children, Iron Deficiency Anemia and Criteria.**Corresponding author:**

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INTRODUCTION:

Breath holding spells are specific to age with an angry or frustrating expression [1]. These kinds of attacks are not good and sometimes frightening for the guardians, caregivers or parents which are initiated by emotional upset or mild trauma [2, 3]. In the time span of the spell, the child cries much with panic like situation. The child may also change its colour into pale or blue or even both the colours. The child may also go for a colonic movement or tonic [4]. Mostly repeated cyanotic form is because of respiration inhibition because of intrapulmonary shunting or autonomic instability. An exaggerated vagal response causes the onset of pallid spells which also leads to noxious stimuli causing brief asystole or bradycardia [5]. These breath holding spells are limited to self only and they also resolve simultaneously. There is a possibility of a prolonged symptom of QT syndrome and abnormalities of paroxysmal cardiac rhythm [6].

Another rare occurrence of even status epilepticus or prolonged syncope complication is also reported among patients [7]. Breath holding spells pathophysiology is of numerous factors and possesses multiple aspects. In the list of various reasons and factors, the deficiency of iron anaemia is prominent [3]. It causes the breath holding spells by reducing the brain oxygenation [6]. A delayed brain stem elation is also a contributing factor of breath holding spells [8]. Among other multiple risk factors, we include the positive history of the family, deficiency of zinc, parents' educational status, the age of the father and sequence of the birth [9].

WHO estimates about 43% children all over the world; whereas, in Pakistan, about 29% of children are facing a deficiency of iron. Iron deficiency is an outcome of deficiency of three micronutrients which include iodine, Vitamin-A and Iron; especially in the underdeveloped countries [10]. Therefore, for all such cases, treatment of iron is recommended [11]. Such patients have also been managed successfully through implantation of cardiac pacemaker and piracetam along with iron supplements [7, 12]. Almost every research conducted at any part of the world about breath holding spells associate it with a deficiency of iron anaemia [1, 3, 13]. Local research reported the iron anaemia deficiency as (56.67%) among breath holding spells patients which were effectively managed through iron supplementation

[13, 14]. No locally available research has been reported so far about the awareness of breath holding spells onset; therefore, we aimed to determine the occurrence of iron deficiency anaemia among children having spells of breath holding. The rationale also focused on the use of iron supplements in order to control anxiety among parents/guardians. As, improved and better outcomes of iron supplements also reduce extra expenditure and fatigue factor of patients and their parents/guardians as there is no such requirement of medical or clinical investigations and reduced hospital visits.

METHODOLOGY:

We conducted this research at Services Hospital, Lahore in the timeframe of November 2016 to August 2017 on a total of ninety-five children of breath holding spells as they fulfilled the inclusion criteria and after agreeing to research protocols by extending their informed consent. Ethical permission of the hospital was also taken before the research commencement. We explained the objective and aim of the research to research participants and their parents/guardians. We strictly observed inclusion criteria and all those not fulfilling the research enrolment criteria were excluded. A thorough examination of children and detailed medical history was documented on a pre-designed Performa. We drained a blood sample of (3 cc) for the evaluation of the level of serum ferritin and complete blood count in the laboratory of the hospital along with the assessment of iron deficiency anaemia.

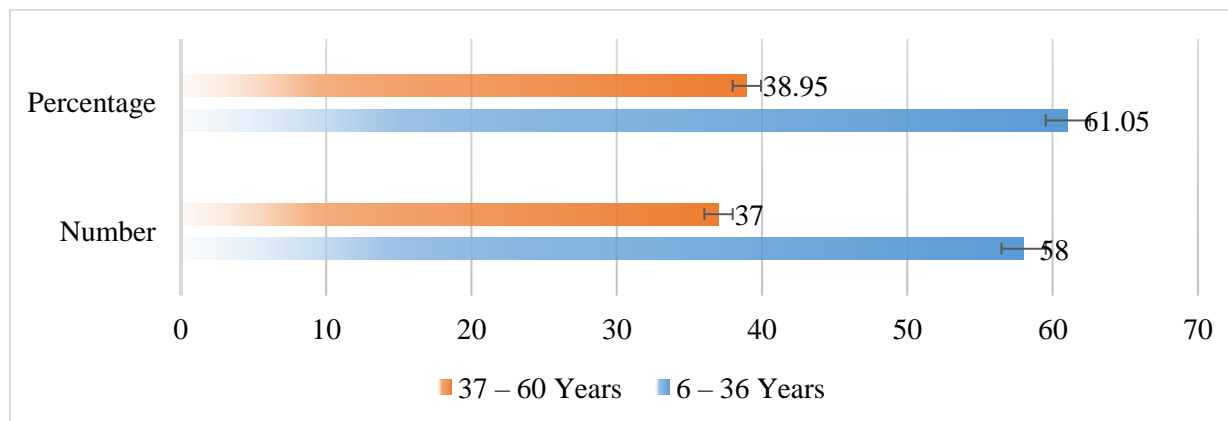
RESULTS:

The age wise distribution of 95 patients was such as 58 children were in the age bracket of (6 – 36) months with a proportion of (61.05%); whereas, 37 children were in the age bracket of (37 – 60) months with a proportion of (38.95%). The mean age of the children was (38.74 ± 11.98) months. Gender distribution was such as 56 children were male (58.95%) and remaining 39 were female (41.05%). Iron deficiency anaemia morbidity was present among 49 children (51.58%); whereas, it was absent among 46 children (48.42%).

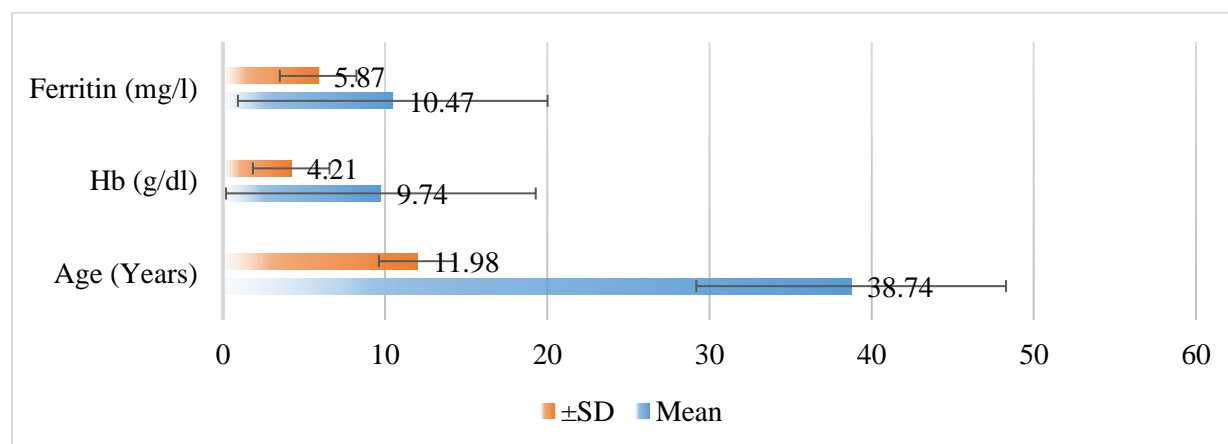
Detailed outcomes of age, iron deficiency anaemia, gender, ferritin and haemoglobin levels are available in Table – I, II, III and IV.

Table – I: Frequency of Iron Deficiency Anemia

Age	Number	Percentage
6 – 36 Years	58	61.05
37 – 60 Years	37	38.95

**Table – II:** Frequency of Iron Deficiency Anemia

Variables	Mean	±SD
Age (Years)	38.74	11.98
Hb (g/dl)	9.74	4.21
Ferritin (mg/l)	10.47	5.87

**Table – III:** Frequency of Iron Deficiency Anemia

Gender	Number	Percentage
Male	56	58.95
Female	39	41.05

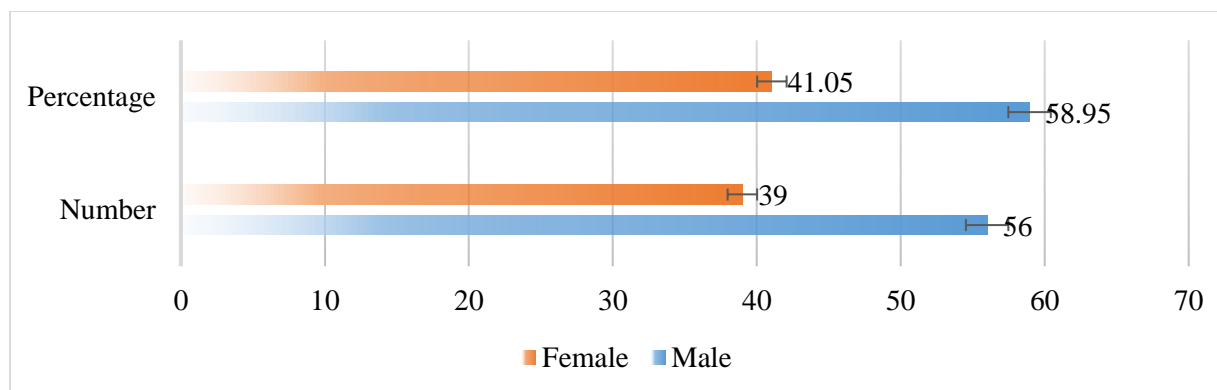
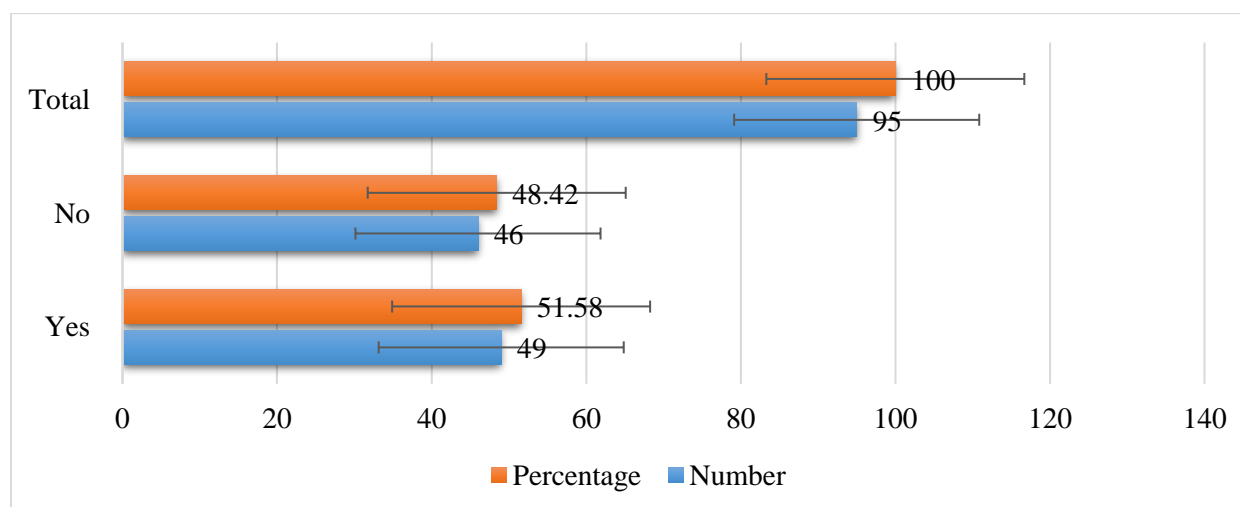
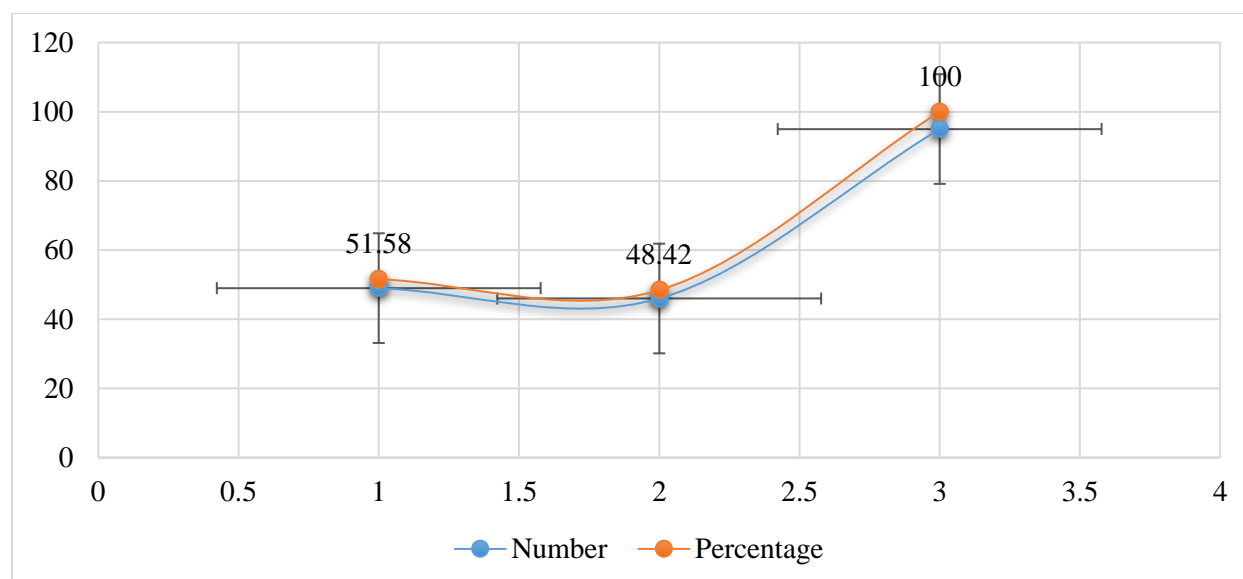


Table – IV: Frequency of Iron Deficiency Anemia

Iron Deficiency Anemia	Number	Percentage
Yes	49	51.58
No	46	48.42
Total	95	100





DISCUSSION:

We aimed to determine the occurrence of iron deficiency anaemia among children having spells of breath holding. The rationale also focused on the use of iron supplements in order to control anxiety among parents/guardians. As improved and better outcomes of iron supplements also reduce extra expenditure and fatigue factor of patients and their parents/guardians as there is no such requirement of medical or clinical investigations and reduced hospital visits.

The age wise distribution of 95 patients was such as 58 children were in the age bracket of (6 – 36) months with a proportion of (61.05%); whereas, 37 children were in the age bracket of (37 – 60) months with a proportion of (38.95%). The mean age of the children was (38.74 ± 11.98) months. Gender distribution was such as 56 children were male (58.95%) and remaining 39 were female (41.05%). Iron deficiency anaemia morbidity was present among 49 children (51.58%); whereas, it was absent among 46 children (48.42%).

Almost every research conducted at any part of the world about breath holding spells associate it with a deficiency of iron anaemia [1, 3, 13]. Local research held at Rawalpindi reported the iron anaemia deficiency as (56.67%) among breath holding spells patients which were effectively managed through iron supplementation [13, 14].

According to Handan, in the series conducted to evaluate the levels of zinc to draw a relation of breath holding spells and zinc and iron 28 children were observed with anaemia (56%); whereas, 22 children did not have any anaemia deficiency (44%) [15]. Another recent research evaluated 64 children in a clinical setting to indicate the association of breath

holding spells among children with deficiency of iron anaemia in the consideration of ECG outcomes and status of neurodevelopment reported 62.5% children having breath holding spells relating to anaemia which were subsequently managed with elemental iron supplementation effectively in the timeframe of twelve weeks [16]. Rahul Jan also reported the effectiveness of iron supplementation to manage breath-holding spells in his series [17]. Iron supplementation was safe and effective among iron replete non-anaemic breath holding spells children. However, our outcomes also show that breath-holding spells children commonly face a deficiency of iron anaemia which can easily be treated with accessible and economic iron supplementations.

CONCLUSION:

Iron deficiency anaemia occurrences were higher among breath holding spells children. However, its management is easy and accessible because of effective and economic iron supplements. These supplements are able to control anxiety. Improved and better outcomes of iron supplements also reduce extra expenditure and fatigue factor of patients and their parents/guardians as there is no such requirement of medical or clinical investigations and reduced hospital visits.

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