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Factors influencing response to treatment for Anemia among school children.

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ABSTRACT - Anaemia is a major health problem in the Developing country. Various measures have been undertaken to reduce the burden of Anaemia among the population, still the burden has not reduced and economic growth is hindered. This study is intended to evaluate the burden and measures to reduce Anaemia with supplementation in school children in 6 to 15 Yrs. of age. Initially we collect demographic information and then supplement with iron tablet supplements for improvement in their Hemoglobin status. This study was conducted in Railway government school, Perumbur Chennai district Tamil Nadu among school from 2017 April to March 2018 children in the age group of 8to16 years revealed that the prevalence of anemia as 58% & the prevalence was much higher among girls 72% when compared to boys 28%. With supplementation of iron tablets with parents/guardian guidance of the pupil, the improvement was seen from 3months to 6 months of duration. So this study was aimed to prevent the prevalence of anemia among low social-economic people and to prevent further Anemia related complications.

Introduction

Anaemia is a major health problem in the Developing country. Anemia is defined as per the WHO standard for children. Anemia is defined as Hb level below 12 g/dL in children of 12–14 years and below 11.5 g/dL in children aged 6–11 years. Severe anemia is defined as Hb level below 7 g/dL in children of 6–14 years of age. Moderate anemia is defined as Hb level 7 g/dL - 9.9 gm/dL in children of 6–14 years of age. Mild anemia is defined as Hb level 10 g/dL -11.4 g/dL in children aged 6–11 years and Hb level 10g/dL - 11.9 g/dL in children of 12–14 years of age[1].

Various measures have been undertaken to reduce the burden of Anaemia among the population, Still the burden has not reduced and economic growth is hindered. Whereas in the developed countries because of better nutritional standards very less number of people are having Anaemia[2]. In developing countries like India we face different kinds of situations where obesity is also on the rise with high prevalence of Anaemia among the population that too in childhood which has a marked impact in the growth phase of children. This study is intended to evaluate the burden and measures to reduce Anaemia with nutritional supplementation in school children in 6 to 15 Yrs of age. Initially we collect demographic information and then supplement with locally available nutritional items for improvement in their Hb status. Any further abnormalities are assessed and managed as per the standard protocol[3].

Target beneficiaries: School children in the age group of 6 to 15 Yrs.

Objectives :

1. To assess the prevalence of anaemia in the primary school children.
2. To study the factors influencing response to treatment for anemia among school children.

Materials & Methods:

i. **Study design -** community based followup study
ii. **Study setting -** School children

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iii. **Study population -** All school children in the age group of 6 to 15 years in a village will be selected as study participants after obtaining necessary permission from parents and the school authorities.

iv. **Study duration –** 1 yr (April 2017 – March 2018)

v. **Inclusion and Exclusion criteria -** Those parents who do not wish to give consent will be excluded from the study

vi. **Study instruments -** Demographic details like age, gender ,parents name, education, occupation ,income, total no of siblings ,order of birth, diet, physical activity, history of worm infestation, deworming drugs usage, history of gastritis & peptic ulcer, surgical history, personal hygiene, will be obtained. Cyanmethemoglobin method will be used to assess Hemoglobin levels. Peripheral blood smear by wedge technique will be done to assess any abnormality of blood cells. MALIN'S INTELLIGENCE SCALE FOR INDIAN CHILDREN will be used to assess the intelligence quotient.

Data analysis:

All the data will be entered in a spreadsheet. SPSS version 16 will be used to analyse the data**.** Proportions and percentages will be used to represent continuous variables. Paired 'T' test will be used to compare the pre and post test. Chi-square test will be used to find out the association between selected variables.

Ethical issues:

Only after obtaining necessary permission from parents and the school authorities the study will be carried out. Blood samples will be collected under strict aseptic conditions.

DISCUSSION

PHASE I

Initially in the first stage demographic details are collected from the school children after obtaining the informed consent from the parents and the school management. The variable includes age, gender, anthropometry, Socioeconomic status, General examination,estimation of hemoglobin by Cyanmethemoglobin method and blood grouping is performed and students with anemia will be identified and informed to the school authorities and parents. A documented record will be maintained.

PHASE II

Children with anemia who have been identified in phase I will be advised to come to our laboratory for complete hematological analysis which includes detailed peripheral smear study further complete hemogram, ESR, liver function test, renal function test and osmotic fragility tests. At the same time biochemical analysis for the following parameters is also done. Students will be assessed for the intelligence quotient using MALINS INTELLIGENCE SCALE FOR INDIAN CHILDREN MISIC This serves as a baseline data. Details will be updated to the folders.

PHASE III

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After the assessment the children will be given nutritional supplementation with locally available food items that is culturally acceptable too. This nutritional supplement along with health education on general hygiene will be given to them for girls who have attained menarche health education on menstrual hygiene will be imparted. After a period of 6 months these children will be assessed for their hemoglobin levels and intelligence quotient. Those children who show improvement will be noted and the results will be analysed. Children who do not show improvement will be evaluated further for influencing factors. For all those children who do not show improvement hemoglobin typing is done. Further tests are also done to find out any other abnormalities.

Developing countries present with a double problem of obesity under –nutrition. Growth is affected when under-nutrition sets in during childhood. As a result both physical and cognitive development is delayed/retarded. Anaemia being a global health problem affects around 50% of the children in developing countries alone. Anaemia is the presenting symptom of disease involving the hematopoietic system in India the data from NFHS-4 reveals 58.5% of children to be anaemic[1]. Although there is reduction in Anaemia status from previous NFHS data, still there are a huge number of children with anaemia, which in turn affects their cognitive and physical development. Since children are the future of the nation, their health is very essential for the development of the nation. Iron deficiency stands tall in the cause of Anaemia in children, where it can be reduced by proper nutrition[1]. But, because of various social and economic factors, there is no adequate nutrition. Other nutrients such as Vitamin –A, B, C, D, E, Zinc, Selenium and Copper etc. also play a role in maintaining Hb status. Apart from that various other factors such as chronic inflammatory diseases also contribute to the burden. School children have increased demand during their growth phase, when the demand is not met it leads to Anaemia (under-nutrition). Nutritional supplementation in the form of locally available food items can be utilized to meet their demand which can be cost effective way and with no side effects. These food items will be even acceptable in all the community without any problem[5].

Nutritional intervention in the form of locally available food - chikki bar and nutritional mix in the form of 75 gram ball & Iron supplements were Given for children whose hemoglobin level was below normal for that age for a period of 3 months initially and after we checked hemoglobin status it was increased and then supplements were given for another 3 months, drastically the hemoglobin level was increased. After that we educated the parents about the nutritional supplementation & Deworming should be done periodically.

Review of the work done in the proposed area at National and international level.

a. A study done Sudhagandhi and Sunderasan 2010 in kattankulathur Chengalpattu district Tamil Nadu among school children in the age group of 8to16 years revealed that the prevalence of anemia as 53 percent. They also found that the prevalence was much higher among girls 68 percent when compared to boys 38 percent[3].

b. A RCT done by Mehta R et al in Mumbai India in 2014 reveals that iron supplement bar consumption on a daily basis improves hemoglobin status in adults with no side effects[5].

Conclusion:

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Children in the age group of 8to16 years revealed that the prevalence of anemia as 58% & the prevalence was much higher among girls 72% when compared to boys 28%. With supplementation of iron tablets with parents/guardian guidance of the pupil, the improvement was seen from 3months to 6 months of duration. So this study was aimed to prevent the prevalence of anemia among low social-economic people and to prevent further Anemia related complications.

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