MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.59218\makrjms.2023.895.898

OPEN ACCESS

Key Words
Poor nutrition, anaemia, global health and morbidity.

Corresponding Author
Debasish Mondal,
Department of and Preventive Social Medicine, College of Medicine and Sagore Dutta Hospital, India

Author Designation:
[1]Doctor
[2]Associate Professor
[3]Professor

Received: 1 August 2023
Accepted: 5 August 2023
Published: 15 August 2023

Citation: Debasish Mondal, Arindam Bandyopadhyay, Dipta Kanti Mukhopadhyay, 2023. Nutritional Deficiency Anaemia among under Five Children in a Hospital Based Cross Sectional Study in Kolkata. Res. J. Med. Sci., 17: 895-898, doi: 10.59218\makrjms.2023.895.898

Nutritional Deficiency Anaemia Among Under Five Children in a Hospital Based Cross Sectional Study in Kolkata

[1]Debasish Mondal, [2]Arindam Bandyopadhyay and [3]Dipta Kanti Mukhopadhyay

[1,2]Department College of Medicine and Sagore Dutta Hospital, India
[3]Department of and Preventive Social Medicine, College of Medicine and Sagore Dutta Hospital, India

ABSTRACT
An under-recognized cause of considerable morbidity in children under the age of five is anaemia related to poor nutrition. Children between the ages of 6 months and 5 years old who have childhood anemia have insufficient hemoglobin levels to adequately oxygenate their bodily tissue. 11 g dL^{-1} is the cut off hemoglobin level for not being anemic. The phrase "nutritional anaemia" refers to all clinical disorders in which the blood haemoglobin concentration falls to an abnormally low level. Iron, vitamin B12 and folic acid are the primary nutrients involved in the synthesis of hemoglobin. Anemia affects 1.6 billion (24.8%) people worldwide and is a major public health issue. It happens at every stage of life but it is more common in young children (under 5 years old) in the preschool years. Globally, 293.1 million (47.4%) children under the age of five are anemic and 67.6% of these children reside in Africa. According to Ethiopia's 2016 demographic and health survey, 57% of Ethiopia's under-five population was anemic. To find out distribution of nutritional deficiency anaemia among under five children according to different nutritional factor and estimate proportion of nutritional deficiency anaemia among under five children.

INTRODUCTION

Anaemia brought on by poor nutrition is a substantial cause of morbidity in children under the age of five that is poorly-recognized. A child who has childhood anemia, which affects youngsters between the ages of six months and five years old, has inadequate hemoglobin levels to adequately oxygenate the body's tissues. The cutoff for not being anemic is 11 g dL^{-1} of hemoglobin. All clinical circumstances in which the blood haemoglobin concentration falls to an unusually low level are referred to as nutritional anemia. Iron, vitamin B12 and folk acid are the primary nutrients involved in the formation of hemoglobin. A major public health issue, anemia affects 1.6 billion (24.8%) people globally. Although, it happens at every stage of life, preschoolers (children under the age of five) are more likely to experience it. Globally, 293.1 million (47.4%) children under the age of five are anemic and 67.6% of these children reside in Africa. According to Ethiopia's 2016 demographic and health survey, 57% of Ethiopia's under-five population was anemic. Anaemia can be caused by a number of things but iron deficiency accounts for over half (43%) of all cases in children. The lack of iron in the diet, iron malabsorption, or increased need for iron during children's rapid growth are possible causes of the shortage.

Among the paediatric age group anaemia remain the significant public health problem which reflect nutritional deficiency, it affect negatively physical growth and increase morbidity. There are various possible ethologies for anemia. The most frequent cause of anemia in children under the age of five, followed by acute blood loss, hereditary conditions, and acquired diseases, is inadequate consumption and absorption of foods high in iron. Iron deficiency and anemia continue to be serious global health issues that primarily impact newborns and young children. In industrialized nations, iron deficiency anemia is still a frequent condition. Despite initiatives to raise public awareness and fortify initiatives for the prevention and management of iron deficiency. Anaemia is clinically determined by a low level of hemoglobin, which is a requirement for the synthesis of iron in red blood cells.In addition to iron, red blood cell synthesis requires a sufficient amount of other nutrients, such as iron. Deficiency An estimated 700 million individuals worldwide were projected to have anemia in 1980 and more than two billion people have been impacted by it. Anaemia is a serious public health issue that affects both industrialized and developing nations. Iron deficiency is the cause of about 50% of anemic patients. The prevalence of anemia is particularly high among youngsters, with rates exceeding 50% in mexico and 45-70% in various regions of Ecuador. Population-based research carried out in many regions of brazil have revealed that the prevalence of anemia varies between 30-60%. As breast milk is replaced by meals low in iron, anemia usually occurs.

The frequency of severe acute malnutrition is highest in India. One of the comorbidities that contributes to higher morbidity in chronically undernourished children is severe anemia. The current study's objectives are to identify the types and prevalence of anemia and to assess the potential causes of severe anemia. When dietary iron intake falls short of long-term iron requirements which are quite high during periods of rapid growth and development iron insufficiency results. Sensitive measure of iron deficiency is elevated by the acute phase response serum-transferrin level when high indicate tissue iron deficiency; however, serum transferrin may also be affected by inflammation and other causes of erythropoiesis due to the impact of inflammation on many biomarkers of iron status, acute phase of protein (c-reactive protein, alpha-1 and be relatively-acid glycoprotein should be assessed when possible).

By far, malnutrition is the main cause of infant mortality. Present in 50% of cases worldwide. India has a higher prevalence of malnutrition than sub-Saharan Africa. India is home to one out of every three malnourished children worldwide.

MATERIALS AND METHODS

Study design: Hospital based cross sectional study.

Place of study: College of medicine and Sagar Datta Hospital, Kolkata.

Period of study: February 2021 to August 2022.

Study population: AU children under 5 years of age admitted to paediatric medicine ward in college of medicine Sagar Dutta Hospital, Kolkata.

Sample size: The expected number of cases would be around 161 subjects.

Inclusion criteria: Children under 5 years of age getting admitted to paediatric medicine ward, college of Medicine Sagar Dutta Hospital, Kolkata.

Exclusion criteria: Acute blood loss, chronic haemolytic anaemia, acute and chronic infection, aplastic anaemia, genetic and hereditary causes of anaemia-diamond black fan syndrome, Fanconi anaemia.

RESULTS AND DISCUSSIONS

The current study was a cross-sectional study conducted at a hospital. This study was carried out at the sagar datta hospital and department of college of

medicine in kolkata from February 2021 to August 2022. 160 patients in all were included in this trial. In our study, 31 (19.4%) of the patients were older than 50 months. (p = .09296) (Z = 1.68) age was not statistically significant. The average age of patients was (30.6369-16.3166) months, which was similar to a research by Baranwal *et al*.[1]. The study investigates the relationship between anemia prevalence in children under the age of five in India and the family environment. 52,868 young children under the age of five form the basis of the study. Majority of cases (75.0%) were in the age range of 6 months to 2 years[2]. Mollah *et al* .[3] demonstrated that anemia is a serious public health issue that affects people all over the world, with rural children and children under the age of five having the highest frequency. The age group 6-24 months was identified as one of the major predictors by multivariate analysis (AOR = 0.02, p = 0.006). Kumar *et al*.[4] showed that, despite several nutritional programs in underdeveloped nations, nutritional anemia is still the main cause of anemia. Children admitted to the study who had anemia-related signs and symptoms ranged in age from 6 months to 14 years. In our study, mean height length of patients was (75.0313±10.0028) and mean weight (kg) of patients was (8.8163±2.6090) were similar study by Kejo *et al*.[5] indicated that the majority of poor nations are affected by anemia, a worldwide health issue. Low birth weight was one of the predictors of anemia found by multivariable logistic regression (adjusted OR (AOR): 2.1, 95% CI: 1.1-3.8). And Kumar *et al.*[4] Despite several nutritional programs in underdeveloped nations, nutritional anemia is still the leading cause of anemia. The majority of the youngsters (60.4%) were malnourished or underweight.

It was found that the mean MUAC (cm) of patients was (11.1019±.3421), mean HB% (g dL^{-1}) of patients was (8.4825±.7514), mean MCV (FL) of patients was (77.1250±27.8854) mean MCH (PG) of patients was (22.9563±9.8200). Similar study by Rahman *et al*.[6]. Anemia has been identified as a widespread problem, especially in Indonesia. The average concentration of hemoglobin was 11.4±1.7 mg dL^{-1}[7]. Anaemia has been identified as one of the leading causes of death among infants under the age of five in Ghana. To measure the haemoglobin (Hb) level, finger prick blood was taken and a thick film was made to determine malaria parasitaemia[7]. South Asia's most anemic countries children under the age of five, as well as women of reproductive age, are especially vulnerable in this region. Two binary outcome variables are addressed separately the presence of anemia in children under the age of five (Hb11.0 g dL^{-1}) and the presence of anemia in women of reproductive age (Hb12.0 g dL^{-1}). In subgroup analysis, children aged less than two years old had the highest pooled prevalence of anemia (50.36%) (95% CI 39.53, 61.18).

In our study the mean SR Iron (µg dL^{-1}) of patients was (43.0438±13.6000), mean SR Ferritin (NG mL^{-1}) of patients was (43.1188±6.2297) and mean SR TIBC PG dL^{-1}) of patients was (535.0500±123.6719) similar study by Ray *et al*.[2]. According to WHO, pre-school-aged children have the highest frequency of anemia. Iron deficiency was found in 139 (69.5%) of the individuals. Kumar *et al*.[4] despite several nutritional programs in underdeveloped nations, nutritional anemia is still the leading cause of anemia. Female children had significantly lower mean iron levels.

Our study showed that the mean VIT B12 (NG mL^{-1}) of patients was (411.4063±200.1094) and mean folic acid of patients was (15.9563±1.9853) were similar study by Ray *et al*.[2] According to the WHO, pre-school-aged children have the highest frequency of anemia. 86 (43.0%) were vitamin B12 deficient and 28 (14.0%) were folic acid deficient. Kumar *et al*.[4] Despite several nutritional programs in underdeveloped nations, nutritional anemia is still the leading cause of anemia. B12 insufficiency was observed in 22.93% of the patients.

Rahman *et al*.[8] the South Asian nations with the highest anemia rates women who are fertile age and children under five are particularly vulnerable in this area. In the subgroup analysis, children under the age of two were shown to have a higher pooled prevalence of anemia (50.36%) (95% CI 39.53, 61.18). In our study, there was a positive link between vitamin B12 (ng mL^{-1}) and age (months), height length and weight (kg) and a statistically significant correlation between vitamin B12 (ng mL^{-1}) and senior TIBC (pg dL^{-1}). We found that there was a negative link between vitamin B12 (ng mL^{-1}) and MUAC (cm), Hb% (g dL^{-1}) but this was not statistically significant and there was a statistically significant correlation between vitamin B12 (ng mL^{-1}) and MCV (fl), MCH (pg), senior iron (g dL^{-1}) and senior ferritin (ng mL^{-1}).

Our research revealed a positive link between folic acid and age (months), height/length, weight (kg), MCV (fl) and MCH (pg), however this was not statistically significant. A positive correlation was also found between folic acid and MUAC (cm) and senior iron (g dL^{-1}), which was also statistically significant. We discovered that there was a negative link between folic acid and senior ferritin (ng mL^{-1}), senior TIBC (pg dL^{-1}), which was statistically significant. However, there was no statistical significance between folic acid and hematocrit (g dL^{-1}).

SUMMARY AND CONCLUSION

The majority of the patients in our study were years old, which was not statistically significant, and the mean age (months) of patients was (30.6369±16.3166). In our study, mean Height/Length of patients was (75.0313±10.0028) and the mean weight (kg) of patients was (8.8163±2.6090). It was found that the mean MUAC (cm) of patients was (11.1019±.3421), mean HB% (GM dL^{-1}) of patients was (8.4825±.7514) and mean MCV (FL) of patients was (77.1250±27.8854) and mean MCH (PG) of patients was (22.9563±9.8200). In our study the mean SR Iron (µg dL^{-1}) of patients was (43.0438±13.6000), mean SR Ferritin (NG mL^{-1}) of patients was (43.1188±6.2297) and mean SR TIBC (PG dL^{-1}) of patients was (535.0500±123.6719). Our study showed that the mean VIT B12 (NG mL^{-1}) of patients was (411.4063±200.1094) and mean Folic Acid of patients was (15.9563±1.9853). In our study, there was a positive association between vitamin B12 (ng mL^{-1}) and age (months), height/length and weight (kg) and a statistically significant positive link between vitamin B12 (ng mL^{-1}) and senior TIBC (pg dL^{-1}). We found that there was a negative link between vitamin B12 (ng mL^{-1}) and MUAC (cm), Hb% (g dL^{-1}) but this was not statistically significant and there was a statistically significant correlation between vitamin B12 (ng mL^{-1}) and MCV (fl), MCH (pg), senior iron (g dL^{-1}) and senior ferritin (ng mL^{-1}). According to our research, there was a positive link between folic acid and age (months), height/length, weight (kg), MCV (fl) and MCH (pg), however this was not statistically significant. There was also a positive correlation between MUAC (cm) and senior iron (g dL^{-1}), which was also statistically significant. We discovered that there was a negative link between folic acid and senior ferritin (ng mL^{-1}), senior TIBC (pg dL^{-1}), which was statistically significant. However, there was no statistical significance between folic acid and hematocrit (g dL^{-1}).

REFERENCES

1. Baranwal, A., A. Baranwal and N. Roy, 2014. Association of household environment and prevalence of anemia among children under-5 in India. Front. Public. Health., Vol. 2. 10.3389/fpubh.2014.00196
2. Ray, S., j. Chandra, J. Bhattacharjee, S. Sharma and A. Agarwala, 2016. Determinants of nutritional anaemia in children less than five year sage. Int. J. Contemp. Pediatr., 2: 403-408
3. Mollah, M., A. Mosaddik, A. Hossain, S. Naznin and A.A. Roy *et al* ., 2021. Key predictors of anemia in under five children in rural setting of Bangladesh: A cross sectional study. American J. Med. Biol. Res. 1: 10-15.
4. Kumar, R., M.K. Singh, V.K. Singh, P. Kumar, S.P. Singh, R. Agrawal and Chandrakanta. 2021. Nutritional anaemia in children in post supplementation era: A cross sectional study. Asian J. Med.Sci., 12: 44-49.
5. Kejo, D., P. Petrucka, H. Martin, M. Kimanya and T. Mosha, 2018. Prevalence and predictors of anemia among children under 5 years of age in arusha district, Tanzania. Pediatr. Health, Med. Ther., 9: 9-15.
6. Sunardi, D., S. Bardosono, R.W. Basrowi, E. Wasito and Y. Vandenplas, 2021. Dietary determinants of anemia in children aged 6-36 months: A cross-sectional study in Indonesia. Nutrients, Vol. 13. 10.3390/nu13072397
7. Parbey, P.A., E. Tarkang, E. Manu, H. Amu and M.A. Ayanore et al ., 2019. Risk factors of anaemia among children under five years in the hohoe municipality, ghana: A case control study. Anemia., Vol. 2019. 10.1155/2019/2139717
8. Rahman, M.S., M. Mushfiquee, M.S. Masud and T. Howlader, 2019. Association between malnutrition and anemia in under-five children and women of reproductive age: Evidence from Bangladesh demographic and health survey 2011. PLOS ONE, Vol. 14. 10.1371/journal.pone.0219170