Sial Journal of Medical Sciences
ISSN Online: 2959-6939
ISSN Print: 2959-6920
Vol. 1, Issue 1, 2022

FREQUENCY OF IRON DEFICIENCY ANAEMIA AND ITS ASSOCIATION WITH PERSISTENT DIARRHOEA, LOW WEIGHT AND PARASITIC INFESTATION IN CHILDREN VISITING TEHSIL HEADQUARTER HOSPITAL DASKA.

Abid Ali Ranjha[1], Hajira Abid Ranjha[2], Riffat Shafique[3], Jawad Ahmed[4], S. Shah Hussain[5], Omar Imran Butt[6], Shizza Ekhtisham[7], Anum Imran Butt [8], Abeer Mustafa Ranjha[9]

Affiliations

1. Ali Hospital Circular Road Daska
2. Ali Hospital Circular Road Daska
3. THQ Civil Hospital Daska
4. THQ Civil Hospital Daska
5. Student of University of Lahore
6. Student of Sialkot Medical College, Sialkot
7. Student of King Edward Medical University, Lahore
8. PGR Sheikh Zayed Hospital, Lahore
9. MBBS Student, Ziauddin Medical College

Corresponding Author:
Dr. Abid Ali Ranjha
Ali Hospital Circular Road Daska
Contact # 0322-6688350
Email: abid1262@yahoo.com

ABSTRACT

BACKGROUND

Iron deficiency anemia (IDA) is a common health problem in Pakistan among younger children. Persistent diarrhea, one of the major causes of malnutrition in children especially under two years of age contributed to IDA resulting in increased mortality and morbidity in developing countries. The incidence and mortality is especially high during infancy in the absences of breast feeding. Number of factors effect prevalence of IDA in this age group, important ones, are low socio-economic status, low weight, worm infestation and persistent diarrhea.

OBJECTIVES

To find out the frequency of IDA among children 1-2 years of age visiting Out-Patient Department of Tehsil Headquarter Hospital Daska, Sialkot by determining the level of total body iron stores by assessment of the Haemoglobin, Serum Ferritin and Total Iron Binding Capacity in the blood; to determine the parasitic infestation by assessment of ova and cyst in the stool samples; and to find out the association of Iron Deficiency Anemia with persistent diarrhea, low weight and parasitic infestation.

MATERIAL AND METHODS

It was descriptive cross-sectional hospital based study in which 345 children 1-2 years of age with persistent diarrhea were included. Socio- demographic characteristics of children and their parents were collected with the help of questionnaire while total body iron stores were determined by assessment of the Hb, Serum Ferritin and TIBC in the blood while parasitic infestation was determined by assessment of ova and cyst in the stool samples.

RESULTS

Among 345 children, 51.0% were one year old, 58.8% males, 85.5% had family monthly income up-to PKR. 20,000 and 67.0% children were living in extended family system. 31.3% of children mothers studied up to grade 10 and 71.0% were housewives/unemployed. 55.9% children were bottle fed, weaning was started among 97.7% children at the age of 6 months, 84.4% were fully vaccinated, 49.0% children had pallor, 44.9% had weight <8 kg and 3.8% had severe dehydration while 9.3% children had Marasmus/Kwashiorkor. According to lab investigations, 53.0% children were anemic, had TIBC >450 µg/dl and serum ferritin level <7 ng/ml while 0.9% children had worm infestation. Data was statistically analyzed using SPSS 20.0. The association of IDA with age, gender, mode of feeding, food allergies and vaccination history was significant

Sial Journal of Medical Sciences
ISSN Online: 2959-6939
ISSN Print: 2959-6920
Vol. 1, Issue 1, 2022

while the association of IDA with persistent diarrhea, weight and parasitic infestation was not significant.

CONCLUSION

Study concluded that iron deficiency anaemia was prevalent among more than half of children but no significant association was found with persistent diarrhea, low weight and parasitic infestation.

KEYWORDS

Association, Iron Deficiency Anemia, persistent diarrhoea, low weight, parasitic infestation, children, Haemoglobin, TIBC.

INTRODUCTION

Iron is almost necessary for all kinds of living organisms. In an individual body, iron's quantitatively commanding role is as oxygen-binding core of hemoglobin (Hb), blood red pigment and transporting the oxygen to entire tissues from lungs. During development of IDA (iron deficiency anemia), hemoglobin synthesis within bone marrow is limited and low hemoglobin in blood results anemia. Anemia due to iron deficiency is called IDA, differentiating this state from several other reasons of anemia, for example, inflammation, infection, nutritional dearth and hematological disorders.[1]

The IDA is a leading public health issues which is most prevalent in both industrialized and developing countries. The IDA is defined as iron deficiency (serum ferritin <12 ng/ml) with Hb levels less than 11g/dl. As per WHO, the IDA prevalence in developing and developed countries is 50-60% and 10-20%, respectively. Worldwide, IDA is believed a 3rd significant cause for disability while thirteenth major risk determinant regarding disability adjusted life years. Majority of the IDA burden is found in the resource poor areas of Asia and Africa.[2,3,4.]

The IDA is an important and widespread dietary health issue among young children and infants residing in developing countries. The global prevalence of anaemia among children 6 to 59 months old is 43 percent while half is associated with IDA. According to WHO global database on anemia, 50.9% of Pakistani children were found to be anemic. Pakistan show different IDA prevalence rates 34%, 73% and 41%. [4-6]

It is recognized that among children IDA is major public health issue which adversely impacts on mortality and morbidity of child and effects the mental growth. In Pakistani children, the IDA prevalence shows a reasonable burden which unduly affects the growth retarded and younger children. During the period of childhood, anaemia is significantly related to poor health, physical growth, middle to moderate deceleration and reduced motor growth as well as leading to poor educational accomplishments and work capability thus reducing the earning capability and damaging the country financial growth in coming future. Also, the IDA enhances the chance of complications and death caused by contagious diseases.[7, 8]

In Pakistan, diarrhea is a common problem among children aged less than 5 years. The severity of diarrhea is commonly noted in infants. Diarrhea could be associated with anorexia, significant weight loss, vomiting, blood passage and fever. The ensuing outpouring of the plasma, blood, mucous and serum proteins enhances faecal volume and liquid content. Mal-absorption could be due to secretory or osmotic mechanisms and the conditions which cause small surface area within bowel. Prolonged diarrhea could lead to anaemia in children living in developing states.[9]

ISSN Online: 2959-6939
ISSN Print: 2959-6920
Vol. 1, Issue 1, 2022

Diarrhea could cause anemia in children residing in developing countries. A study carried out among refugee Palestinian children demonstrated that diarrhoea recent episode was related to an enhanced risk of IDA. While another study suggested that anaemia was a significant cause for diarrheal disease. Also, it is probable that association is global and it becomes a vicious cycle that diarrhea enhancing the chances of anemia while anemia enhances the later chance of diarrhea.[2, 9]

Infections caused by parasites are an important public health dilemma among developing states and are leading reasons for death and morbidity. These infections are held responsible for persistent diseases for example IDA and diarrheal diseases, that are main cause of child mortality in India, Bangladesh, Pakistan and several other emerging countries of the world.[10]

The identification of IDA is carried out mostly on lab measurements basis. Although, tests commonly utilized have some limitations because of their reduced specificity or sensitivity, or as they are customized by the circumstances other than IDA such as inflammation. Therefore, combining various iron status markers provide optimum evaluation regarding iron status.[11]

The CBC (complete blood count) could indicate low levels of Hb. Serum ferritin reflects total body iron stores. Most helpful single lab value regarding IDA, a diagnosis could be the plasma ferritin[4] but during inflammatory disease it may rise and in Pakistan every child suffers from infection 2 – 4 times a year. The treatment of IDA depends mainly on oral supplements of iron, which are required as a first-line treatment. The most frequently utilized preparations are ferrous fumaroles, ferrous sulfate, ferrous gluconate but their major side effects are gastrointestinal disturbances. Treatment should be continued for at least 3 months at a dosage of 3-6mg per kg daily, best taken between meals on an empty stomach.[11]

Iron Deficiency anaemia is a common and prevalent health problem in Pakistan among younger children. Persistent diarrhoea may contribute to Iron deficiency anaemia. Persistent diarrhoea is one of the major causes of malnutrition in children especially under two years of age and this leads to great mortality and morbidity in developing countries. The incidence and mortality is especially high in infancy and more so in the presence of malnutrition and lack of breast feeding. A number of factors effect prevalence of IDA in children, major relate to dietary iron intake. However, socio economics status, education and even hygiene can have relevance on prediction and prevalence of IDA among the children in addition to impaired absorption of iron in persistent diarrhea. In Pakistan information on the true prevalence and predictors of IDA is limited. This study will also educate the parents about the different believe regarding the diet selected for the children under two year during diarrhoea and prevention of IDA.

No serious effort has been made to find out the association of hemoglobin level with serum ferritin and TIBC in the children suffering from diarrhea yet. Similarly there was no focus on worm infestation, one of the important cause of anemia. Looking at these and the fact that no such study has been done in peri- urban area where this study was planned. Current study aims to investigate IDA in children 1-2 years of age with persistent diarrhea, low weight and parasitic infestation using data from patients suffering from diarrhoea.

OBJECTIVES

The objectives of this study are to find out the frequency of iron deficiency anemia

among children 1-2 years of age visiting children department, by determining the level of TBI stores by assessment of Hemoglobin, Serum Ferritin and Total Iron Binding Capacity in blood, to determine the parasitic infestation by assessment of ova and cyst in the stool samples, as a co-factor of childhood Anaemia and to find out the association of iron deficiency anemia with persistent diarrhea, low weight and parasitic infestation.

MATERIAL AND METHODS

STUDY DESIGN: It was a cross-sectional hospital based study.

STUDY SETTING: The study was carried out in Pediatric Department of Tehsil Head Quarter Hospital Daska, District Sialkot in 2018-2019.

SAMPLING TECHNIQUE: Non probability convenient random sampling

SAMPLE SIZE: Sample size was 345 according to World Health Organization (WHO) sample size calculator using prevalence of iron deficiency anemia i.e. 34%[5]in Pakistan with confidence level 95% and absolute precision of 5%.

SAMPLE SELECTION: All patients 1-2 years of age with persistent diarrhea with grade II or more stools and whose parents were willing to participate were included in the study. Patients with co- morbid conditions like cardiac, renal disease, pneumonia, meningitis, and sepsis with abdominal distension were not included.

DATA COLLECTION PROCEDURE: The parent, accompanying child was interviewed by the researcher with the help of a semi-structured questionnaire to know the demographic and socioeconomic characteristics of respondents and duration of breast feeding. Questionnaire was pretested and modified before the start of interviews. Weight of child was noted with the help of weighing machine to know failure to thrive/ grow.

Blood sample of the child was taken for assessment of Hemoglobin, Serum Ferritin and Total Iron Binding Capacity to know the level of TBI stores. Stool samples were taken for the assessment of Ova and Cyst to find out worm infestation. Iron-deficiency anaemia was labeled when there was a decreased total iron body content. It occurs when the serum ferritin level and hemoglobin level is <12 ng/ml and <11 g/dl, respectively.[12] Parasite infestation is proved after getting positive laboratory result for ova or any parasite stage in stool examination.[13] Diarrhea is the passage of three or more loose or liquid stools per day.[14] Persistent Diarrhea was defined as the acute episodes of diarrhea that last for 14 days or longer and are presumed to be infectious.[14]

RESULTS

Among 345 children, 176 (51.0%) were 1 year old and 103(29.9%) children were 1.5 years old while 66 (19.1%) children were 2 years old. The mean age of the children was 1.341±0.38 years. Among 345 children, more than half 203 (58.8%) were males and 142 (41.2%) were females. Majority 295 (85.5%) had family monthly income upto 20,000 rupees while only 50 (14.5%) children had family monthly income more than 20,000 rupees. The mean family income was 20000.40 ± 6645.30 rupees. Among 345 mothers of children, 17 (4.9%) were professionals, 245(71.0%) were housewives/unemployed and 83 (24.1%) mothers were skilled workers. Out of 345 mothers of children, 6 (1.7%) were postgraduate, 25 (7.2%) had done their graduation, 31 (9.0%) mothers studied upto intermediate, 108 (31.3%) mothers had matriculation certificates, 87 (25.2%) studied upto middle (Grade-8) and 33 (9.6%) had primary education (Grade-5) while 55 (16.0%) mothers were illiterate. Among 345 children, 114 (33.0%) were living as nuclear families while mainstream 231 (67.0%) of children were living in extended family system. Result shows that

among 345 children, 290 (84.1%) were Muslims while 55 (15.9%) children were Non-Muslims. Among 345 children, 89 (25.8%) were on breast feeding and 193 (55.9%) were on bottle feeding while 63 (18.3%) children were on both (breast and bottle feedings). Among 8 (2.3%) children weaning was started at the age of 4 month while among majority 337 (97.7%) weaning was started at the age of 6 months. Result shows that 147 (42.6%) children had food allergies while 198 (57.4%) children had no such problem. Majority 291 (84.4%) were fully vaccinated and 29 (8.4%) children were partially vaccinated while 25 (7.2%) children were unvaccinated and notified to health authorities. Majority of children 263 (76.2%) had fever, followed by dehydration in 271 (78.6%), vomiting 149 (43.2%), weight loss 36 (10.4%), blood in stool on history 35 (10.1%), cough 16 (4.6%), skin rashes 7 (2.0%) and worm infestation 3 (0.9%). Among 345 children, 155 (44.9%) had weight <8 kg and 177 (51.3%) children had 8-10 kg while 13 (3.8%) children had weight 11-12 kg. Out of 345 children, 74 (21.4%) had no dehydration while majority 258 (74.8%) had some dehydration and 13 (3.8%) children had severe dehydration. According to lab investigations, more than half 183 (53.0%) children were anemic (hemoglobin <11 g/dl) while 162 (47.0%) children were normal (hemoglobin ≥11 g/dl). Among these children, 183 (53.0%) had TIBC >450 µg/dl and 162 (47.0%) children had TIBC ≤450 µg/dl (normal). Out of 345 children, 183 (53.0%) had serum ferritin level <7 ng/ml while 162 (47.0%) children had serum ferritin level>7 ng/ml (normal).Among 345 children, only 3 (0.9%) had worm infestation on stool examination while majority 342(99.1%) of children had no worm infestation. Result shows that prevalence of anemia among children was 53.0%. Table 1

Among 176 children who were 1 year old, 79 (22.9%) had IDA while 97 (28.1%) had no IDA. Among 103 children who were 1.5 year old, 59 (17.1%) had IDA and 44 (12.8%) had no IDA. Among 66 children who were 2 years old, 45 (13.0%) had IDA and 21 (6.1%) had no IDA. The result was found statistically significant (P=0.001). Among 203 children who were males, 92(26.7%) had IDA and 111 (32.1%) had no IDA. Among 142 children who were females, 91 (26.3%) had IDA and 51 (14.9%) had no IDA. The result was found statistically significant (P=0.002). Among 295 children who had family monthly income upto 20,000 rupees, 149 (43.2%) had IDA and 146 (42.3%) had no IDA. Among 50 children who had family monthly income > 20,000 rupees, 34 (9.8%) had IDA and 16 (4.7%) had no IDA. The result was found statistically insignificant (P=0.391). Among 245 mothers of children who were housewives, 132 (38.3%) children had IDA and 113 (32.7%) had no IDA. Among 100 mothers of children who were working women, 51 (14.7%) children had IDA and 49 (14.3%) had no IDA. The result was found statistically insignificant (P=0.875). Among 290 mothers of children who were literate, 153 (44.3%) children had IDA and 137 (39.7%) had no IDA. Among 55 mothers of children who were illiterate, 30 (8.7%) children had IDA and 25 (7.3%) had no IDA. The result was found statistically insignificant (P=0.172). Among 114 children who were living as nuclear family, 61 (17.7%) had IDA and 53 (33.0%) had no IDA. Among 231 children who were living in extended family system, 122 (35.3%) had IDA and 109 (31.7%) had no IDA. The result was found statistically insignificant (P=0.903). Among 89 children who had history of breast feeding, 37 (10.7%) had IDA and 52 (15.1%) had no IDA. Among 193 children who had history of bottle feeding, 107 (31.0%) had IDA and 86 (24.9%) had no IDA. Among 63 children who had history of both (breast & bottle feedings), 39 (11.3%) had IDA and 24 (7.0%) had no IDA. The result was found statistically insignificant (P=0.028). Among 8 children

who were given weaning at the age of 4 months, 5 (1.4%) had IDA and 3 (0.9%) had no IDA. Among 337 children who were given weaning at the age of 6 months, 178 (51.6%) had IDA and 159 (46.1%) had no IDA. The result was found statistically insignificant (P=0.588). Among 147 children who had food allergies, all (42.6%) had IDA. Among 198 children who had no food allergies, 36 (10.4%) had IDA and 162 (47.0%) had no IDA. The result was found statistically significant (P=0.000). Among 291 children who were fully vaccinated, 143 (41.5%) had IDA and 148 (42.9%) had no IDA. Among 29 children who were partially vaccinated, 21 (6.1%) had IDA and 8 (2.3%) had no IDA. Among 25 children who were unvaccinated, 19 (5.4%) had IDA and 6 (1.8%) had no IDA. The result was found statistically significant (P=0.003). Among 155 children who had weight <8 kg, 85 (24.6%) had IDA and 70 (20.2%) had no IDA. Among 177 children who had weight 8-11 kg, 89 (25.8%) had IDA and 88 (25.5%) had no IDA. Among 13 children who had weight 11-12 kg, 9 (2.6%) had IDA and 4 (1.2%) had no IDA. The result was found statistically insignificant (P=0.348). Among 3 children who had parasitic infection, 2 (0.6%) had IDA and 1 (0.3%) had no IDA. Among 342 children who had no parasitic infection, 181 (52.4%) had IDA and 161 (46.7%) had no IDA. The result was found statistically insignificant (P=0.635).

DISCUSSION

Iron deficiency anemia is a leading health problem among children in both industrialized and developing countries. During the period of childhood, anemia is significantly associated with physical and mental retardation, causing reduced work capacity and academic achievements. Parasitic infection is also a major health problem among children residing in developing countries like Pakistan and is associated with repeated episodes of diarrhea and iron deficiency anemia. Persistent diarrhoea contributes to IDA and can cause severe weight loss, fever, vomiting, anorexia and passage of blood. If prolong, dehydration occurs leading to weight loss and growth failure. A number of factors that affect the prevalence of IDA in children are namely low socio-economic status, parents' education and even hygiene in addition to impaired absorption of iron during persistent diarrhea. Current study was carried out to assess the frequency of iron deficiency anemia and its association with persistent diarrhea, low weight and parasitic infestation in children 1-2 years of age, visiting tehsil headquarter hospital Daska, District Sialkot. To achieve these objectives, 345 children aged 1-2 years old were included in the study and their mothers were interviewed.

Our study revealed that more than half of the children (51.0%) were one year old and rest of the children (49.0%) were upto two years old. The findings of a study conducted by Maroof and coworkers (2018) highlighted that most of the children (74.9%) were one year old while 25.1% children were upto 2 years old.[16] Our study showed that male children were in majority (58.8%) while 41.2% were female children. But the results of a study carried out by Ahmad and associates (2018) showed different scenario that most of the children (55.6%) were females and 44.6% were male children. Similarly Abdel-Rasoul et al also confirmed in their study that female children were more (51.3%) than male children (48.7%). Reason of this difference of this study with other studies might be conservative society in the study area. People usually do not care for female children so the number of female children suffering from acute diarrhea are less in number in children Out-patient departments[11,17].

An elevated level of family monthly income is associated with child health as it indirectly prevents children from

numerous infectious diseases including diarrhea. This study revealed that significant majority (85.5%) of children had family monthly income up-to PKR 20,000 per month and 14.5% had more than PKR 20,000. The results of a study undertaken by Maroof et al regarding this variable are better than our study results which confirmed that 54.0% children had family monthly income up-to PKR 20,000 per month and almost half (46.0%) of children had family monthly income more than PKR 20,000 per month. Reason of this discrepancy in family monthly income may be due to the fact that present study was carried out in semi-urban area where most of the people were poor. [16]

Breast feeding is very beneficial for children as it protects them from several diseases. It was very encouraging to know that 44.1% were breast fed. But a study carried out by Dagnew et al elucidated that only 16.7% children were breast fed. Reason of this could be cultural difference between the two studies. Culture of the study area is conservative where women in the lactating stage are encouraged to feed their children from breast milk. In addition to that poor socioeconomic conditions compelled them not to purchase costly formula milk.[18]

Weaning is very essential for children. It is the most significant transitional period for babies because they start tasting and eating of food during this period. It is important to mention that weaning was started at 6 months among majority (97.7%) of children. Similarly, previous study also confirmed that among majority (71.2%) weaning was started at 6 months while weaning in remaining proportion (28.8%) was started at the age of <6 months or above.[18]

During study, vaccination status of children was also assessed and found that most of the children (84.4%) were fully vaccinated. Likewise, another study done by Wangusi et al also asserted that massive portion (96.1%) of children was found fully vaccinated. results of this study are comparable with other studies. It is due to the fact that expanded program on Immunization in most part of the Punjab, Pakistan are working amicably. [20]

Our study showed that for all (100%) children duration of diarrhea was more than 14 days while the numbers of stools were 8-12 per day. A similar study carried out by Quadri et al highlighted the same duration of diarrhea among 31.1% children while 23.2% children had > 6 stools daily.[21]

Study also evaluated the other associated problems with diarrhea and found that majority of the children had dehydration (78.6%), followed by fever (76.2%), vomiting (43.2%), weight loss (10.4%), blood in stool on history (10.1%), cough (4.6%), skin rashes (2.0%) and worm infestation (0.9%). But the results of the study conducted by Murye et al demonstrated that majority of the children had malaria (26.9%) along with diarrhea, followed by cough (22.7%), poor appetite (19.1%), pale eyes and vomiting (0.3%). Study further disclosed that almost half of the children had weight less than 8 kg. Results of this study are comparable with other studies regarding dehydration, fever and vomiting associated with diarrhea.[20,22] Study revealed that on clinical examination, none of the patients had hepatomegaly, splenomegaly and jaundice. But the study done by Nyeko et al elucidated that hepatomegaly and splenomegaly were identified among 42.0% and 8.0% children, respectively. Reason for this discrepancy may be that majority of patient in this study did not under-go detailed examination. [22]

This study further indicated that 47.0% children had normal levels of Hemoglobin (Hb), TIBC and Serum Ferritin while remaining 53.0% had anemia as well as low level of Hemoglobin (Hb), Serum

Ferritin and TIBC is higher than the normal range. The findings of our study are comparable but showed better situation than the study undertaken by Chandyo et al who reported that 43.0% children had normal levels of Hb and serum ferritin[23]. But a study carried out by Darlan et al highlighted that more than half (58.3%) of the children had normal TIBC level.[24]

In this study, only 0.9% children had worm infestation on stool examination while the study done by Javaid et al confirmed that 17.2% children were found positive for worm infestation on stool examination. Reason of this discrepancy might be due to non-availability of proper stool sample. It was very appalling to note that in this study, Iron Deficiency Anemia (IDA) was prevalent among 53.0% children but the study performed by Abdel-Rasoul et al confirmed that 25.6% children had IDA. Another study undertaken by Darlan et al elucidated that iron deficiency anemia was prevalent in only 7.6% children. Increase level of IDA in this study might be due to increase frequency of stools in patients.[24, 25]

When the association between socio-demographic characteristics and iron deficiency anemia was assessed, study found significant results about age and gender ($p < 0.05$) while insignificant results regarding monthly income, mother occupation, mother education and family type ($P > 0.05$). A similar study carried out by Abdel-Rasoul et al showed significant association ($p < 0.05$) for mother education but insignificant association for child gender ($P > 0.05$). Results of another study performed by Howard et al showed significant association regarding child age, gender and mother education ($P < 0.05$).[9,11]

As far as association between nutritional history and iron deficiency anemia is concerned, study found significant association for food allergies ($P < 0.05$) but insignificant association regarding mode of feeding and time of weaning started ($P > 0.05$). A study carried out by Woldie et al found insignificant association between time of weaning started and iron deficiency anemia. In this study significant association was observed between vaccination status of children and IDA ($P < 0.05$) but a study done by Murye et al showed insignificant association between both variables ($P > 0.05$).[20] Study further disclosed that there was no significant association regarding persistent diarrhea, weight of child, parasitic infestation and iron deficiency anemia ($P > 0.05$). The findings of a study conducted by Ali et al demonstrated that there were insignificant differences regarding persistent diarrhea, low weight and iron deficiency anemia. A study performed by Darlan et al found insignificant association between parasitic infestation and iron deficiency anemia.[7, 24]

CONCLUSION

In Pakistan, diarrhea is a significant problem among children aged less than five years. Due to diarrhea, Iron Deficiency Anemia (IDA) is more prevalent due to poor nutritional health issues among infant and children. Present study which assessed the frequency of Iron Deficiency Anemia and its association with persistent diarrhea, low weight and parasitic infestation in children 1-2 years of age, visiting tehsil headquarter hospital Daska, District Sialkot, concluded that Iron Deficiency Anemia was prevalent among more than half (53 %) of the children but no significant association was found with persistent diarrhea, low weight and parasitic infestation. Therefore, further studies are needed on large scale regarding same topic.

REFERENCES

1. Domello M, Hernell O. Iron-deiciency anaemia during the first two years of life. Scandinavian Journal of Nutrition 2002;46(1):20-30.
2. McDonagh MS, Blazina I, Dana T, Cantor A, Bougatsos C. Screening and routine supplementation for iron deficiency anemia: a systematic review. Pediatrics 2015;135(4):723-33.
3. Kanchana M, Ahuja S, Nagaraj N. Prevalence and risk factors of anemia in under five-year-old children in children's hospital. International Journal of Contemporary Pediatrics [Internet] 2018;5(2):499-502.
4. Habib MA, Black K, Soofi SB, Hussain I, Bhatti Z, Bhutta ZA, et al. Prevalence and predictors of iron deficiency anemia in children under five years of age in Pakistan, a secondary analysis of national nutrition survey data 2011–2012. PloS one 2016;11(5):e0155051.
5. Ullah I, Zahid M, Sthanadar AA, Sthanadar IA, Ali PA, Khan MI, et al. Iron Deficiency Anemia in School Age Children in District Karak Khyber Pakhtunkhwa Province, Pakistan. Open Journal of Blood Diseases 2014;2014.
6. Malik NA, Shah SA, Mashhadi SF. Evaluation of Injectable Iron Sucrose Therapy in Children with Iron Deficiency Anemia. Pakistan Armed Forces Medical Journal 2016;66(5):680-83.
7. Woldie H, Kebede Y, Tariku A. Factors associated with anemia among children aged 6–23 months attending growth monitoring at Tsitsika Health Center, Wag-Himra Zone, Northeast Ethiopia. Journal of nutrition and metabolism 2015;2015.
8. Wangusi NL, Waudo JN, Mugendi BJ. Prevalence and determinants of iron-deficiency anaemia among children 6-23 Months attending Thika level-5 hospital, Kiambu County, Kenya. 2016.
9. Howard CT, de Pee S, Sari M, Bloem MW, Semba RD. Association of diarrhea with anemia among children under age five living in rural areas of Indonesia. Journal of tropical pediatrics 2007;53(4):238-44.
10. Noori MY, Khan G, Abid I, Baig S, Zamir S, Sharafat S. Demographics of Intestinal Parasitic Infections in Karachi: An Insight from Positive Stool Samples. Parasitic Intestinal Infections in Karachi J Islamic Int Med Coll 2016;11:20-3.
11. Abdel-Rasoul GM, El Bahnasy RE, El Shazly HM, Gabr HM, Abdel-Aaty NB. Epidemiology of iron-deficiency anemia among primary school children (6-11 years), Menoufia governorate, Egypt. Menoufia Medical Journal 2015;28(3):663.
12. Ahmad MS, Farooq H, Maham SN, Qayyum Z, Waheed A, Nasir W. Frequency of anemia and iron deficiency among children starting first year of school life and their association with weight and height. Anemia 2018;2018.
13. Kassaw MW, Abebe AM, Tlaye KG, Zemariam AB, Abate BB. Prevalence and risk factors of intestinal parasitic infestations among preschool children in Sekota town, Waghimra zone, Ethiopia. BMC pediatrics 2019;19(1):437.
14. Behrman R, Kleigman R, Arvin A. Nelson Textbook of Paediatric: Iron deficiency anaemia. Pennsylvania: WB Saunders Company; 1996.
15. Zahid A, Shaukat A, Mahmood KT. Lactose Intolerance. J Biomed Sci and Res 2010;2(4):290-4.
16. Maroof S, Rehman MU, Mahmood H, Masood S, Mashhadi SF. Determinants of Diarrhea in Childern upto Two Years of Age: In A Tertiary Care Hospital, Rawalpindi. Pakistan Armed Forces Medical Journal 2018;68(4):893-98.
17. Ahmad MS, Zaidi SAH, Medhat N, Farooq H, Ahmad D, Nasir W. Frequency of underweight and stunting among children entering school in a small urban locality and their association with academic performance. J Pak Med Assoc 2018;68(1):28-32.

ISSN Online: 2959-6939
ISSN Print: 2959-6920
Vol. 1, Issue 1, 2022

18. Dagnew AB, Tewabe T, Miskir Y, Eshetu T, Kefelegn W, Zerihun K, et al. Prevalence of diarrhea and associated factors among under-five children in Bahir Dar city, Northwest Ethiopia, 2016: a cross-sectional study. BMC infectious diseases 2019;19(1):417.
19. Din Z, Pervez L, Amir A, Abbas M, Khan I, Iqbal Z, et al. Parasitic infections, malnutrition and anemia among preschool children living in rural areas of Peshawar, Pakistan. Nutrición hospitalaria: Organo oficial de la Sociedad española de nutrición parenteral y enteral 2018;35(5):1145-52.
20. Murye JW. The prevalence of iron deficiency and the associated factors in children aged 6-59 months in central equatoria state, Juba-south Sudan: University of Nairobi; 2014.
21. Quadri F, Nasrin D, Khan A, Bokhari T, Tikmani SS, Nisar MI, et al. Health care use patterns for diarrhea in children in low-income periurban communities of Karachi, Pakistan. The American journal of tropical medicine and hygiene 2013;89(1_Suppl):49-55.
22. Nyeko R, Kalyesubula I, Mworozi E, Bachou H. Lactose intolerance among severely malnourished children with diarrhoea admitted to the nutrition unit, Mulago hospital, Uganda. BMC pediatrics 2010;10(1):31.
23. Chandyo RK, Ulak M, Adhikari RK, Sommerfelt H, Strand TA, editors. Prevalence of iron deficiency and anemia among young children with acute diarrhea in Bhaktapur, Nepal. Healthcare; 2015: Multidisciplinary Digital Publishing Institute.
24. Darlan D, Ananda F, Sari M, Arrasyid N, Sari D. Correlation between iron deficiency anemia and intestinal parasitic infection in school-age children in Medan. 2018.
25. Javaid MK. Prevalence of Intestinal Parasitic Infestations Among Children. Journal of Rawalpindi Medical College 2016;20(3):216-8.