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Anemia and iron deficiency anemia in school children of district Swat Khyber Pakhtunkhwa Pakistan

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Abstract

The randomized study, on school children's at rural area of District Swat. A rural area of Jare village of Madyan was selected for the study. Total 100 subjects, both male and female, with apparently looking anemic were selected in the age range of 5-16 years. Out of the total 40 students were Anemic having percentage (40%), 10 were presenting Iron Deficiency anemia having percentage (19%) and 40 were normal students having frequency (40%). It was concluded from the study that in children it impairs physical and psychological development, reduces immunity to infections, poor academic performance and limits physical activity and most prevalent nutritional problem in the world. Early diagnosis is better to cure the disease.

Keywords: Anemia, iron deficiency anemia, school children, district Swat

Introduction

Iron deficiency is the commonest form of malnutrition worldwide and according to the World Health Organization affects 43% of the world's children [1]. Deficiency may be due to inadequate dietary intake of iron, low level of absorption because of small bowel pathology, increased physiological requirements during rapid growth in infancy and adolescence and chronic blood loss usually from the gastrointestinal or urinary tracts or because of menorrhagia in adolescent girls (WHO, 2001). Iron-deficiency anemia is a major nutritional problem throughout the world and leads to serious health problems, such as poor cognitive and motor development and behavioural problems, in children [3]. Malnutrition remains the world's most serious health problem and the single biggest contributor to child mortality. Nearly one third of the children in the developing world are either underweight or stunted and more than 30 % of the developing world's population suffers from micronutrient deficiencies. Under nutrition is a process whose consequences are often extended not only in later life, but also into future generations. Deficiencies of key vitamins and minerals continue to be pervasive and they overlap considerably with problem of general under nutrition [4]. In growing children, malnutrition affects intelligence and physical capacity. These in turn reduces productivity, slows economic growth and aggravates poverty. The economic cost of malnutrition is very high [5]. The prevalence of underweight children in India is highest in the world. Child malnutrition in school going children is responsible for 22 % of the country's burden of diseases [2]. Though the aggregated level of under nutrition is shockingly high, the picture is further magnified by the significant inequalities across the states and socioeconomic groups and location with those living in rural area being worst affected [6]. The age of 5 to 15 years is a period of transition between childhood and adulthood which occupies a crucial position in the life of human beings. This period is characterized by an exceptionally rapid rate of growth. School provides the most effective and efficient way to reach large portion of the school age population [6]. Most research on the behavioral effects of iron deficiency and anemia has focused on the cognitive function of infants and pre-schoolers, and on the physical work productivity of adults [7]. Iron deficiency anemia is most prevalent and severe in young children and women of reproductive age [8]. As a result, these groups have been the focus of most epidemiologic investigations of the problem and its causes. However, iron deficiency anemia is also common among school-age children. In developing regions of the world, the prevalence of anemia in 5-12-years old is estimated to be 46%, with the highest rates found in

Africa (49%) and South Asia (50%) [1]. The school-age years are an opportune time to address this problem for several reasons. Iron deficiency impairs children’s cognitive abilities, and interventions to prevent and correct iron deficiency may enhance children’s learning potential in school [9]. Improving the iron status of schoolchildren will also increase their fitness and work capacity [10]. The present study was carried out to evaluate the frequency of iron deficiency anemia in rural school children of district Swat and to assess its underlying cause (risk factor).

Material and Methods

The randomized study, on school going children’s of Swat. A total of 100 students with age of 5-16 years were recruited for the study with informed consent, for each student and parents in case of minor included in the study. 3cc blood sample was taken by puncturing the vein of subjects in a sterilized 5cc BD syringe. The blood samples were labelled with corresponding details of name, age and sex and were recorded separately. The samples of blood were mixed with anticoagulant, EDTA to prevent from clotting that was present in the 5cc BD syringe. The samples were transferred at the nearest lab of Saidu Medical College Swat for final analysis of;

1. Hemoglobin level (Hb)
2. Mean Corpuscular Volume (MCV)
3. Mean Corpuscular Haemoglobin Concentration MCHC
4. RBC morphology.

Table 3: Table showing the statistical analysis of the subjects

Name	Hb(g/dl)	RBC(million)	MCV (fl)	MCH (pg)	MCHC%	Serum iron (ug/dl)
Mean	8.2	4.21	69	18.41	27.89	56.84
Standard deviation	0.96	0.49	8.36	5.16	3.47	7.65

Different parameters of the suspects

The details of the normal, anemic and iron deficient anemic students are given in the following graph 1.

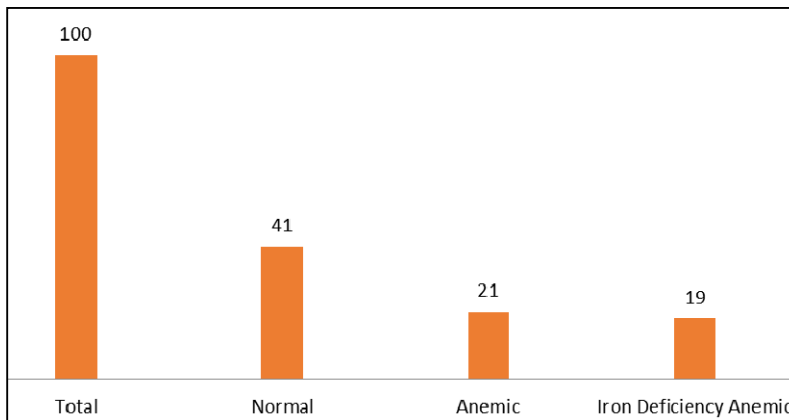


Fig 1: Graph showing the details of the students

Discussion

The importance of preventive care has been widely emphasized, and a growing body of preventive services is routinely proposed by various expert panels and professional organizations. They range all the way from new born metabolic and hearing screening to counselling, assessment, and determination of nutritional or genetic roots of the problem if any. Various studies have exposed significant lack of knowledge about iron deficiency. The causes of anemia in the developing world are multifactorial and include nutritional deficiencies, extra-corporal blood loss, higher prevalence of

Results

Socio- economic status of the suspects

During the study it was found that the socio economic conditions of the suspected families were not good. The details of the socio economic conditions are given in table 1.

Table 1: Table showing the socio economic conditions of the children.

Monthly salary of Family	Boys (%)	Girls (%)
3000-5000	10 (18.51%)	07 (15.21%)
>5000-7000	15 (27.77%)	11 (23.91%)
>7000-9000	20 (37.03%)	18 (39.13%)
>9000-12000	9 (16.66%)	10 (21.73%)
Total	54 (100%)	46 (100%)

Age of the suspects

During the study the students of the different age were selected. The details are given in the table 2.

Table 2: Table showing age and sex of the suspects

Age	Boys	Girls	Total
6-8 years	12	08	20
9-11 years	19	15	34
12-14 years	23	23	46

Subjects suffering from iron deficiency anemia

During the study the subjects were diagnosed. The details are given in the table 3.

hemoglobinopathies, and inflammation. These etiologies often coexist and are difficult to distinguish due to limited diagnostic capabilities in resource-poor settings. The objective of this study was to investigate the frequency of iron deficiency in school going children (5 – 16 years) at rural area of District Swat. A rural area of Jare village of Madyan was selected for the study. The subjects selected were in the age range of 5-16 years. It included 100 subjects, both male and female, with apparently looking anemic. The blood hemoglobin value, RBC counting and morphology, serum iron level analyses revealed that 41 subjects were normal, 40

were having Hb level less than 11g/dL, hence suffering from anemia. 19 subjects were having iron deficiency anemia. The higher frequency of the iron deficiency in this particular area as compared to the prevalence of iron deficiency anemia as 1.2% in United States of normal weight children ^[11], 12.2% prevalence of anemia in rural school children in a coastal area of Morocco ^[12] and 35% in northern Morocco ^[14] may be due to less or no knowledge of nutrition. The Socio-cultural condition of the area and the dietary habits may not be the sole cause of nutritional insufficiency of iron. However, a very rare practice of the routine clinical check-up of the otherwise normal children and their habits of the junk food may be the cause of the high frequency. The rare medical check-up increases the risk of individuals to have intestinal worms. A periodic check-up and hence to de-worm the children may decrease the incidence of iron deficiency anemia of the people of this area.

Conclusion

Iron deficiency anemia is a serious health problem affecting mostly children and women of reproductive age and poor families have great chances of iron deficiency because of poor diet. In children it impairs physical and psychological development, reduces immunity to infections, poor academic performance and limits physical activity and exercise. It is the most prevalent nutritional problem in the world. Diagnosis and treatment of iron deficiency anemia is bears less cost among the four basic approaches for the prevention of iron deficiency anemia are supplementation with iron, education and associated measures to increase dietary intake, the control of infection and the fortification of the food with iron. Signs and symptoms of anemia are non specific and difficult to detect. Simple laboratory tests should therefore be used to diagnose and determine its severity.

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