Status of Anemia and Different Types of Anemia in the Adolescent Population Residing in Chandigarh

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Background: This study aimed to assess anemic statistics and identify different types of anemia in the adolescent population residing in the Chandigarh area.

Methods: The research was conducted focusing on understanding the prevalence of anemia across various age groups. Samples of adolescents residing in Chandigarh were selected, and data collection regarding anemic status was done through medical examinations and laboratory tests.

Results: The study categorized anemia into different types, including iron-deficiency anemia, vitamin B12 deficiency anemia, folic acid deficiency anemia, sickle cell anemia, and others based on established diagnostic criteria.

Analysis: The findings revealed that anemia is a notable health concern among the adolescent population in Chandigarh. The age group [46-66] exhibited the highest out of total anemic conditions, followed by the age group [16-20]. The remaining age groups [26-30], [36-40], [31-35], [21-25], [41-45] and [10-15] demonstrated varying levels of anemia prevalence. These results suggest that anemia is more prevalent in older age groups, highlighting the potential cumulative effects of nutritional deficiencies or chronic conditions over time. The study's findings underscore the need for targeted interventions and awareness campaigns to prevent and manage anemia, focusing on the identified high-risk age groups.

Conclusion: However, it is essential to note that the study has some limitations due to the sample size and specific geographical location. Further research depth and more diverse samples are warranted for anemia prevalence and its associated factors in the adolescent population residing in Chandigarh.

Keywords: Anemia, prevalence, iron deficiency, adolescent population

1   Introduction

Promoting balanced nutrition, raising awareness about anemia prevention and management, and ensuring access to healthcare services for timely diagnosis and treatment are strategies for anemic rate reduction. Recommendations that future studies investigate the underlying causes of anemia in the adolescent population of Chandigarh to develop more tailored interventions.

The current status of anemia and the different types of anemia in the adolescent population is a big problem. Anemia is characterized by a decrease in the number of red blood cells or low hemoglobin in the blood, leading to reduced oxygen-carrying capacity. It can result from various causes, including nutritional deficiencies, chronic diseases, inherited disorders, blood loss, and other factors.

2   Different Types of Anemia Include

- **Iron-deficiency anemia:** This is the most common type globally, often caused by insufficient iron intake or poor iron absorption. Iron deficiency anemia is commonly associated with inadequate dietary iron, blood loss (such as heavy menstruation), and certain medical conditions.
- **Vitamin B12 deficiency anemia:** A deficiency of vitamin B12 can lead to anemia. This can occur due to inadequate dietary intake of vitamin B12 (commonly found in animal products), malabsorption issues, or certain medical conditions affecting the absorption of this vitamin.
- **Folic acid deficiency anemia:** Folic acid, also known as folate, is essential for red blood cell production. Inadequate intake of folic acid-rich foods or malabsorption issues can result in folic acid deficiency anemia.
- **Sickle cell anemia:** Sickle cell anemia is an inherited blood disorder characterized by the sickle-like shape of RBCs. It primarily affects individuals of African, Mediterranean, Middle Eastern, and Indian descent.

In the present study, we have collected the CBC profiles of the people who attended the OPD and IPD during the period, of the study. Along with the peripheral blood film report of anemia patients coming to OPD of GMSH-16.

3   Materials and Methods

Study design and area
This prospective design collected the CBC profiles of the people who attend the OPD and IPD, for the problems related to the anemic conditions at Multispecialty Hospital in Chandigarh.

Study population
In order to complete the work, the analysis of the study recruited 100 patients of different age groups and gender.

Inclusion and exclusion criteria
Not all patients who attend OPD and IPD were concerned.

Only the ones who were presenting with anemic conditions were considered in our study.

During the study, the PBF reports were taken, and types of anemia were noted. In total, we have collected 100 participants of different age groups and analyzed them statistically, represented as follows:
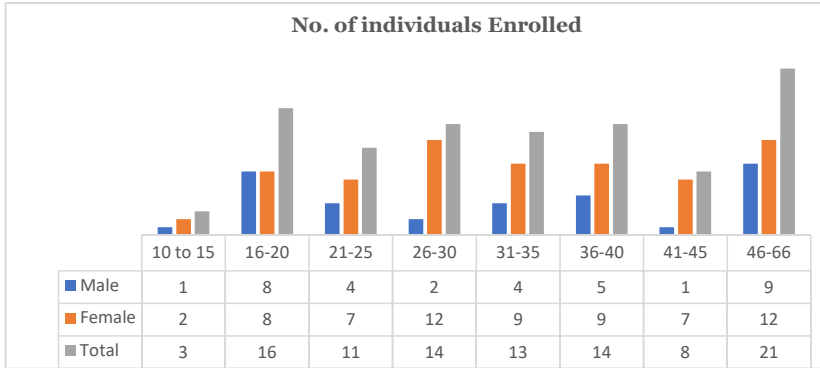
Figure 1: The above Chart illustrates the status of anemia in the participants examined during the study period.

The above graph shows the total population and the male and female persons who attended the hospital with the complaint of anemia.

Complete information about the CBCs and other biochemistry information has been collected. The percentage of males and females was collected and statistically, the percentage of males and females in each age group having anemic conditions was investigated in GMSH-16.

It shows that the age grouping having the highest number of total anemic patients of both genders is [46-66] represented by 21 participants during the given period, followed by the age grouping of [19-25] represented by 19 participants, and the rest age groupings [26-30], [36-40], [14-18] and [41-45] are represented respectively by 14, 14, 11, and 8 participants. Observed from May 09, 2023, to Jun 14, 2023.

- Identification of how many males and females are in each age grouping is represented in Chart 1.
- Data reports of patients were submitted to the doctors on duty then the follow-up and identification of the exact anemic condition types were mentioned on their files with recommendations treatments, in which the interest of the work was to identify types of anemia observed in patients. The following chart represents the types of anemia found in different age groups.
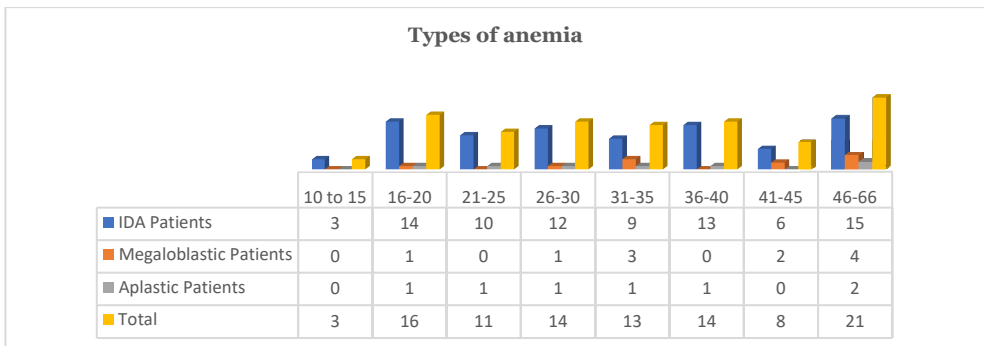
Figure 2: Types of anemia identified during the study.

There was a significant difference in the population of the individuals who showed anemic conditions.

Three types of anemia were found during the investigation of our study in 100 recruited participants.

The heading type of anemia between them was IDA with 80% of the total populationparticipating, in the second position comes megaloblastic anemia with 13%, and after comes Aplastic anemia represented by 7% of patients having this anemia type.

4   Results

We have analyzed the present study conducted in the Pathology and Medicine department since May 09, 2023, in which 100 subjects were covered. A briefing was given to all participants about the objective of this study and assured confidentiality in the collection of personal data. The present study was conducted in the following parts: Guidelines were followed and a questionnaire was designed to collect basic information about the participants, with the affirmation of doctors on duty about the result reports.After the questionnaire, Hemoglobin (Hb) level was assessed on the spot and subjects with anHb level below 12.5 g/dl were considered. After the selection for follow-up based on the above parameters. Anemia was ascertained based on PBF reports. Analysis of records of blood cells was done to access major reasons for lower Hb. Data for such analysis were collected from the pathology department, emergency, Male and female medical wards.

In total 100 voluntary subjects were analyzed for CBC by a fully automatic 5-part hematological analyzer for the presence of anemic conditions patients attending GMSH-16 Chandigarh. Additional tests were ordered by doctors on duty and mentioned on their medical files to evaluate serum ferritin levels, iron, total iron-binding, total iron binding capacity, and transferrin.Based on the provided information, a study conducted from May 09, 2023, to Jun 14, 2023, indicates that the age group with the highest number of total anemic conditions in both genders is the [46-66] age group, represented by 21 participants. The second-highest number of anemic conditions is observed in the [16-20] age group, with 16 participants. The remaining age groups, [26-30], [36-40], [31-35], [21-25], [41-45] and [10-15] are represented by 14, 14, 13, 11, 8 and 3 participants, respectively.

5   Discussion

These findings suggest that anemia has a higher incidence in the older age groups. The [46-66] age group, includes individuals approaching or in middle adulthood. Anemia in the elderly is thought to be a risk factor for a variety of morbidities and an increase in mortality. Anemia is frequently associated with assumed illnesses that are more common in the elderly[1]. This could be attributed to several factors, including the cumulative effect of nutritional deficiencies or chronic conditions that may develop or persist over time. Inquisitive illness in females regarding their prevalent anemia conditions has screened that a large number of them who came from rural areas have been through malnutrition and presenting microcytic hypochromic anemia in the morphology of their blood[2].The second-highest number of anemic conditions among individuals aged [16-20] implies that anemia remains a significant concern during early adulthood. Being Underweight was common in the study conducted on diet among adolescents[3]. This age group may face specific challenges related to lifestyle factors, such as inadequate dietary choices, irregular eating habits, or increased demands for growth, and pregnancy, which can contribute to anemia development. The relatively lower numbers of participants in the [26-30], [36-40], [21-25], [41-45], and [10-15] age groups suggest that anemia prevalence may be slightly lower among these groups. Further investigation with larger sample sizes would be necessary to draw more definitive conclusions about anemia prevalence in these specific age groups. Different states of rural India reported the concordance prevalence of anemia with our results, in Uttar Pradesh[4], [5] These findings highlight the need for targeted interventions and awareness campaigns to address

anemia, especially in the [46-66] and [16-20] age groups. Strategies may include promoting balanced nutrition, increasing awareness about anemia prevention and management, and ensuring access to healthcare services for timely diagnosis and treatment. Additionally, future studies should explore the underlying causes of anemia in the studied population to guide more effective prevention and management efforts. Also, the study was conducted in Delhi and is serious in adolescent girls and a supplement of nutrients is needed despite various national programs on this subject[6].Poverty in society leads to malnutrition. Loss of accountable amount of blood during menstruations which occurs in girls mostly in some cases during their adolescent period, excess bleeding, deficiencies of iron, G6PDH enzyme, B12 or folic acid, and hemoglobin A1, all are different types of anemia causals. Production of insufficient element iron in women pregnant may cause serious issues when no supplements are provided in particular scarcities[7]. In cases where teenagers are exposed to sexual intercourse, risks are in high probability on teen girls we can enumerate pregnancy at their young age while normally it is supposed to be the stage of the body in demand for growth instead of providing and caring for the fetus. So, they are most commonly exposed to anemia conditions in which in the absence of financial stability for the follow-up conducts to the serious states of morbidity and sometimes mortality. Researchers, in this case, have found out that the statistic of the study has more expressed microcytic anemia type over other types morphologically[8].In the study conducted in pediatrics by Nilofer.Jasima, anemia is the more vulnerable affected age group due to the effects on children's growth, high risk of death with malnutrition, and infection aspects [9]. Due to the cost of investigations, a huge number of the population cannot afford them and sometimes the lack of evidence for any other disease is considered to have iron deficiency[10]. In the years 2015 and 2016, research conducted in India, an anemic condition in children was worrying in prevalence[11]. In cases where teenagers are exposed to sexual intercourse, risks are in high probability on teen girls we can enumerate pregnancy at their young age while normally it is supposed to be the stage of the body in demand for growth instead of providing and caring for the fetus. So, they are most commonly exposed to anemia conditions in which in the absence of financial stability for the follow-up conducts to the serious states of morbidity and sometimes mortality. Researchers, in this case, have found out that the statistic of the study has more expressed microcytic anemia type over other types morphologically[8]. A study conducted in Chhattisgarh reported that in India as well as in developing countries fetal get this condition from low maternal incomes, and consumption of sufficient nutrients is supportively taken care of[12].It is important to note that the above discussion is based on the provided information and assumes that the study was conducted in a scientifically rigorous manner. To gain a comprehensive understanding of the study and its implications, it would be helpful to review the complete research findings, including methodology, statistical analysis, and limitations mentioned in the study.

6   Conclusion of The Study

Significant observations of the conducted study have been detailed below. Major findings for lower Hblevels were as follows: In total, 100 subjects were investigated, of which 34% were male subjects while 66% were females who were reported as having anemic conditions. Dietary habits and low consumption of iron nutrients in foods contributed to around 80 % of the total case causes.

The study reveals that 30% of participants were under 25 years old of which 13% percent were male and 17% were female having anemic conditions. Lower Hb was due to different causes based on tests performed for conditions such as IDA, Liver disorder, Renal failure, Bone marrow disorders, loss of iron, and bleedingvitamin deficiency. The study period was from 09.05.2023 to 14.06.2023 during which 100 subjects were collected and investigated. Total IDA conditions were found to be 80 % from 100 participants The rest of the subjects found were Megaloblastic conditions and aplastic anemic conditions proportionally represented respectively as 13% and 7%.

7   Future Prospective and Suggestions

Mild anemia is a condition that may occur in anyone and standing at a higher probability of being treated. The risk of having this condition is common including in women during their menstrual periods and pregnancy and even in frequent blood donors or a condition of not getting enough iron, vitamins, or even being under treatment and medicines, such as chemotherapy. The condition could be serious though in the way of chronic inflammation due to infections, kidney disease, cancer, or autoimmune diseases.

Research-based on dietetic studies to improve nutritional quality is needed in society to prevent iron deficiency caused by poor consumption of iron.

8   Acknowledgment

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