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To Investigate the Prevalence of Anaemia among Young Women in the Aurangabad Region

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ABS TRAC T

***Objective*:** Among the demographics most impacted by iron deficiency are female adults and adolescents. The purpose of this research was to determine the prevalence of anaemia, a common low haemoglobin disease, among young women in the Aurangabad area (MS). Females should typically have haemoglobin levels between 12.1 and 15.1 g/dL. However, anaemia is growing increasingly prevalent in young women due to contemporary lifestyle, nutritional consumption, changed eating patterns, etc. ***Methods*:** The research included 108 female college students. Sahli's hemoglobinometer was used to test the haemoglobin (Hb) level. When Hb is less than 12 g/dL, it is referred to as anaemia. Based on the Hb values, the anaemia was further divided into three categories: severe, moderate, and mild. ***Results*:** For 108 young female pupils in the Aurangabad area (MS), the entire data was accessible. 83.34 percent of people had anaemia. 16.66 percent of the individuals had normal haemoglobin levels. ***Conclusion*:** Anaemia is common among 18 to 25-year old females of Aurangabad region (MS). Iron supplementation is thus required for the target group.

Keywords: *Haemoglobin, Anaemia, young females.*

INTRODUCTION

Haemoglobin

Red blood cells include a protein called haemoglobin, which is a two-way respiratory carrier that carries oxygen from the lungs to the tissues and helps carry carbon dioxide back. Haemoglobin has a strong affinity for oxygen in the arterial circulation and a weak affinity for carbon dioxide, organic phosphates, and ions of hydrogen and chloride. These relative affinities are inverted in the venous circulation [1-3].

Functions of Haemoglobin

Red blood cells include a protein called haemoglobin, which is a two-way respiratory carrier that carries oxygen from the lungs to the tissues and helps carry carbon dioxide back. Haemoglobin has a strong affinity for oxygen in the arterial circulation and a weak affinity for carbon dioxide, organic phosphates, and ions of hydrogen and chloride. These relative affinities are inverted in the venous circulation [4-8].

Anaemia

About 25% of people worldwide suffer from anaemia, which is still a serious public health issue [9, 10]. Both nutritional and non-nutritional causes, such as iron, certain vitamins, copper, and protein shortages, may cause anaemia. Non-nutritional reasons include bleeding, infection, chronic illness states, or medication toxicity [9, 11]. The primary cause of anaemia is still iron deficiency. Iron deficiency is thought to be the cause of 75% of anaemia, followed by folate and vitamin B12 deficits [9, 12, 13]. Inadequate iron reserves for the baby, increased risk of low birth weight or preterm, perinatal and neonatal death, increased risk of maternal illness and mortality, and decreased physical activity, mental focus, and productivity are all consequences of anaemia in women. Even slight anaemia may cause weariness and limit a woman's

ability to work. There is a need for fresh and creative approaches, especially those that enhance the general health and nutritional condition of teenage females prior to their reproductive years [14]. According to age, gender, and pregnant status, the WHO defines anaemia as follows for children: Anaemia in children aged 6 months to 5 years is defined as a haemoglobin level less than 11 g/dL. It is defined as Hb < 11.5 g/dL for children aged 5 to 11, Hb < 13 g/dL for adult males, Hb < 12 g/dL for non-pregnant females, and Hb < 11 g/dL for pregnant females [13, 15]. In this research, anaemia was defined as a Hb concentration level of less than 12 g/dL.

Types of anaemia

Iron Deficiency Anaemia

Anaemia is often caused by iron deficiency [17]. Iron deficiency anaemia (IDA) results from the body's iron reserves being depleted as a result of either increased iron loss or utilisation or reduced iron intake. IDA is primarily caused by decreased heme synthesis in mature erythrocyte precursors and gastrointestinal blood loss, which is often brought on by medication administration [18, 13]. Iron supplements, either oral or parental, are often successful in treating (IDA) [17]. A variety of iron salts have been used, with ferrous sulphate being the most popular [13]. How well intravenous iron works to treat iron deficient anaemia was found to be 73% in the general population, outperforming oral iron supplementation [19].

Sickle Cell Anaemia

The most prevalent and severe type of sickle cell anaemia (SS) is the homozygous status for sickle haemoglobin (HgbS). Compound heterozygous conditions for HgbS and other hemoglobinopathies, including Hgb C and β-thalassemia, are also included in sickle cell disease (SCD) [20]. The genetic deficiency will be passed on since both homozygous and heterozygous patients will live to reproductive age [21]. The most popular analgesic for treating mild-to-moderate pain is paracetamol. As a result, acetaminophen exposure is substantial for sickle cell disease patients throughout their lives. Ibuprofen, acetaminophen with codeine, and acetaminophen with oxycodone were the most often utilised painkillers for children with sickle cell disease. The most popular treatments were rest, massage, prayer, and spiritual healing by others [22].

Aplastic Anaemia

The illness known as aplastic anaemia is immune-mediated [26]. Pancytopenia and bone marrow aplasia or hypoplasia are the hallmarks of acquired aplastic anaemia (AA), a dangerous haematologic condition. With success rates ranging from 60% to 80%, immunosuppressive treatment and bone marrow transplantation (BMT) are presently the primary therapeutic methods utilised to treat both adults and children [27]. For the vast majority of young children with severe aplastic anaemia, allogeneic stem-cell transplantation from histocompatible sibling donors is curative [23].

Pernicious Anaemia

Pernicious anaemia is a severe anaemia that mostly affects older persons. It is caused by the stomach's inability to absorb vitamin B12 and is characterised by excessively large red blood cells, gastrointestinal problems, and spinal cord lesions. Lack of intrinsic factor is another cause of pernicious anaemia, which may potentially be an autoimmune condition. Finding different autoantibodies aids in diagnostic confirmation and, therefore, patient care. Vitamin B12 injections or oral supplements are recommended for these individuals [24].

Polycythemia Vera

Polycythaemia Vera is a sporadic myeloproliferative disease that affects many organ systems and causes an increase in red blood cell mass [25]. Leuko-erythroblastosis, anaemia with teardrop-shaped red blood cells, splenomegaly, thrombocytopenia or thrombocytosis, severe bone marrow fibrosis, and systemic symptoms (fever, weight loss, bone pain) are its hallmarks. Pipobroman (PB) is a medication that works well for treating PV when used with myelosuppressive drugs.Chemotherapy and repeated venesections are necessary for the effective treatment of Polycythaemia Vera [25].

Anaemia in young Indian females

Numerous surveys and studies have been conducted across India to identify anaemia in young girls. In Andhra Pradesh, a study was conducted to look at the prevalence and contributing factors of anaemia in women. The National Family Health Survey 1998/99 (NFHS-2) offers nationally representative cross-sectional survey data on women's nutrition, body weight, haemoglobin status, socioeconomic and demographic characteristics, and other aspects at the household and individual levels. In the Indian sample, 52% of all women had anaemia. Of these women, 15% had moderate anaemia (Hb 70–99 g/l) and 2% have severe anaemia (Hb <70 g/l). The significant frequency of anaemia among teenage girls and women is confirmed by smaller-scale micronutrient insufficiency research carried out in India. According to worldwide benchmarks and the women's haemoglobin level, they categorised them as mildly, moderately, or severely anaemic (WHO). A concentration of less than 70 g/l of haemoglobin was used to define severe anemia, 70–99.99 g/l for moderate anemia, and 100–109.99 g/l to correspond to mild anemia in pregnant women (n=170) and 100–119.99 g/l for non-pregnant women. However, only 2.2% of women were classified as being very anaemic. 52% of slender women, 50% of normal-weight women, and 41% of overweight women were found to be anaemic. The prevalence of severe anaemia varied from 1% for overweight women to 4% for thin

women, whereas the prevalence of moderate anaemia varied from 9% for overweight women to 17% for thin women [14]. To determine the incidence of anaemia in adult men and non-pregnant females of the rural north Indian population, a house-to-house survey was conducted in seven villages of Raipur-Rani block in the district of Panchkula, Haryana state (North India), from April 1994 to December 1995. The total prevalence of anaemia in the 16–70 age range was found to be 47.9%, with 44.3% of men and 50% of females. In this group, mild anaemia was more common than moderate and severe anaemia (males: 29.3%; females: 32%) [27]. To determine the prevalence of anaemia among teenage girls and to investigate the sociodemographic factors linked to anaemia, a cross-sectional survey was carried out in an urban area under the Urban Health Training Center, Department of Preventive and Social Medicine, Government Medical College and Hospital, Nagpur. This research involved 296 teenage girls between the ages of 10 and 19. The research ran for six months, from October 2002 to March 2003. It was discovered that 35.1% of people had anaemia. Hb <12 gm% for non-pregnant teenage girls and Hb <11 gm% for pregnant adolescent females were their established criterion for anaemia. Anaemia was discovered in 104 (35.1%) of the 296 individuals [28].

METHOD

Following the SRM IRB's ethics clearance, all clinical components of the trial were started. At least two working days before to the IRB meeting, the protocol, CRF, and ICF were sent to the IRB for audit. A significant number of young female volunteers were gathered in order to measure the haemoglobin count using the Sahlis Haemoglobinometer technique in order to investigate the state of anaemia in the Aurangabad area.

Sahli's Haemoglobinometer consisted of:

1. Comparator box
2. Special diluting tube
3. Haemoglobin pipette
4. Glass stirrer
5. A bottle containing 10 N HCL
6. The diluting tube was filled to the lowest level with 10N HCI.

The diluting tube was stored in the designated area of the package. Rectified spirit was used to sterilise the fingertip. A relatively big drop of blood was obtained by a fast puncture. Without any air bubbles, the blood was drawn into the haemoglobin pipette until it reached the 20 mm3 threshold. Cotton was used to remove any blood that had adhered to the pipette's sides and tip. Immediately, the blood was poured into the diluting tube containing the acid. The pipette was moved into the diluting tube after being washed with the acid two or three times. After that, it was combined and left undisturbed for ten minutes to allow the conversion of haemoglobin to acid haemoglobin. After ten minutes, the contents were diluted by adding distilled water drop by drop, mixing with the stirrer after each drop until the hue matched the standard. Then, by observing the lower meniscus, the reading was obtained in both gram and percentage scales.

All 108 participants, who were young ladies between the ages of 18 and 25, had their haemoglobin levels measured. They were then divided into four groups: severe anaemia, moderate anaemia, mild anaemia, and normal healthy volunteers. The proportion of incidence in each category was used to represent the findings.

RESULT AND DISCUSSION

The study's objective was to examine the anaemia prevalence among young women in the Aurangabad area (MS). As a result, 108 females were chosen as the sample size, and Sahli's hemoglobinometer was used to measure their haemoglobin levels. Only 18 of the 108 females—or 16.66% of the whole group under investigation—were determined to have normal haemoglobin levels. With haemoglobin values of up to 8, 8–11, and 11–12 g/dL, respectively, the remaining 90 females were judged to be anaemic and divided into three categories: severe anaemic, moderate anaemic, and light anaemic. It was discovered that 19, 50, and 21 females were severe, moderate, and mild. 17.60, 46.30, and 19.44 percent were anaemic, respectively. The information has been represented visually.

Table 1: Prevalence of different types of anaemia as observed in young female population along with their percentage values

Type of Anaemia	HB level	No. of females	Percentage
Severe	Up to 8 g/dL	19	17.60
Moderate	8-11 g/dL	50	46.30
Mild	11-12 g/dL	21	19.44
No anaemia (Normal)	12-15 g/dL	18	16.66
	Total	108	100

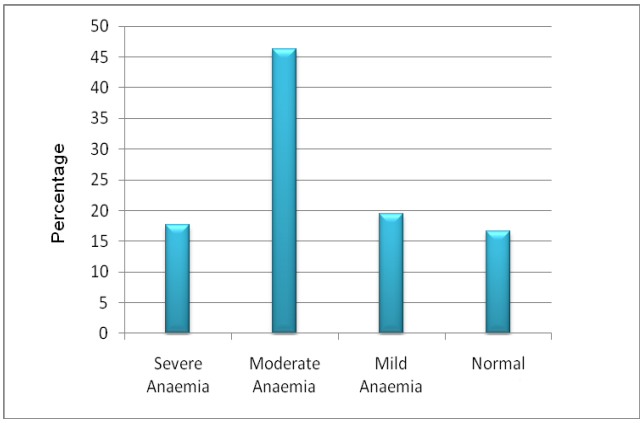

Figure 1: Graphical Representation of occurrence of types of Anaemia in young female population

CONCLUSION

To pinpoint the precise risk factors for anaemia, further investigation is advised. Implementing strategies to raise young girls' nutritional awareness and understanding might be beneficial. Lastly, initiatives for nutrition education and intervention should address anaemia by emphasising the amount and quality of micronutrient content in the diet. The efficacy of each of these therapies has to be tracked.

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