Examining the prevalence of moderate to severe anaemia in adults aged 18 to 60 in urban areas

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ABSTRACT: Iron deficiency anaemia is still a serious public health issue, especially in cities where dietary and lifestyle choices greatly increase the condition's incidence. This study focuses on several age subgroups within the young adult population in order to determine the overall prevalence of iron deficiency anaemia among people in an urban setting who are between the ages of 18 and 60. Through the analysis of data from a representative sample of urban dwellers, the study determines the prevalence and distribution of iron deficiency anaemia, looks at the socioeconomic and demographic factors that affect its prevalence, and identifies any notable differences between the 18–60 age range. It is anticipated that the results will shed important light on the prevalence of iron deficiency anaemia in urban settings and guide focused treatments and public health initiatives to lessen its effects. To guarantee a thorough assessment of the disease, the study combines clinical evaluations, laboratory testing, and demographic surveys. According to early findings, iron deficiency anaemia is quite common, with variations that highlight the need for specialized preventative measures and public health strategies that cater to the unique requirements of various age groups within the metropolitan population Globally, anaemia is a serious health issue. The prevalence of anaemia is higher in developing nations due to socioeconomic and health issues. Males and females between the ages of 18 and 60 are the most susceptible to anaemia.
Determining the extent of anaemia among people in urban areas between the ages of 18 and 60 was the goal of this study. The target population included of adults between the ages of 18 and 60 who were sampled at the G.S.V.M. Medical College Kanpur Haematology Collection Centre .

KEYWORDS: Anaemia, age groups, Haemoglobin, MCV, MCH.

INTRODUCTION

The World Health Organization (WHO) defines anaemia as a condition where the haemoglobin (HGB) content or the number of red blood cells (RBCs) falls below a specified reference range (<12 g/dL in non-pregnant women and <13 g/dL in men), which impairs the body's ability to carry oxygen to meet physiological demands. [1]. Urban individuals between the ages of 18 and 60 who suffer from moderate to severe anaemia pose a serious public health risk. A shortage of red blood cells or haemoglobin levels is known as anaemia, and it can cause weakness, exhaustion, weakened immune systems, and lower productivity.

However, depending on environmental and personal factors, the ideal threshold for healthy people may differ.

Anaemia is thought to be the most common micronutrient deficiency condition in the world, mostly affecting those from lower socioeconomic backgrounds and as a result

of poverty. [2] The frequency of anaemia is particularly high in low- and middle-income nations, and it primarily affects children under five, expectant and nursing mothers, and the elderly. [3]

The following are the main causes of anaemia in urban adults:

1. **Nutritional Deficiencies:**

- **Iron Deficiency:** The most frequent cause of anaemia, particularly in women of reproductive age, which is brought on by a poor diet and elevated iron requirements during menstruation, pregnancy, and lactation (4)
- **Folate and vitamin B12 Deficiency:** These deficiencies can cause anaemia and can be brought on by a poor diet, diseases that affect malabsorption, or increased demand during pregnancy. (5)

o **Bad Dietary Practices:** Processed foods that are deficient in vital minerals like iron, folate, and vitamin B12 may be a staple of urban diets.

2. **Increased Prevalence in Women:**

- **Menstrual Blood Loss:** Women are more likely to acquire anaemia as a result of blood loss, especially if they have heavy menstrual cycles. (6)
- **Pregnancy:** Due to their sometimes-elevated iron needs, pregnant women are at risk for iron-deficiency anaemia if their food consumption is inadequate. (7)

3. **Chronic Diseases:**

- **Chronic Infections:** Anaemia can be caused by or made worse by diseases like HIV/AIDS, TB, or malaria. (8)
- **Chronic Kidney Disease:** can hinder the synthesis of red blood cells because erythropoietin levels are lowered.(9-10)
- **Diabetes:** can result in renal problems and persistent inflammation, which might cause anaemia.(11)

4. **Lifestyle Factors :**

- **Urbanization & Sedentary Lifestyles :**
  Anaemia can be exacerbated in urban environments by a lack of physical activity and high levels of stress. Furthermore, eating a lot of fast food and depending too much on convenience meals results in nutritional imbalance.(12)
- **Smoking and Alcohol use :** Smoking and binge drinking can both impair the body's capacity to absorb or use vital nutrients, which can result in anaemia.(13)

5. **Environmental Factors:**

- **Air Pollution:** Because air pollution impairs general health, (14) including cardiovascular and respiratory processes, it can make diseases like anaemia worse in some metropolitan places.(15)

MATERIAL AND METHODS STUDY SETTING:

Description of the study

This study will be conducted in Department of Haematology, G.S.V.M . Medical College Kanpur. The goal of the study is to determine the prevalence of various forms of anaemia, as well as its severity and correlation with the study participants' age, sex, and other CBC parameters. In order to ascertain the prevalence of various forms of anaemia treated at the G.S.V.M. Medical College and Hospital outpatient department (OPD), this study employed data from Complete Blood Counts (CBC) conducted by haematology analysers (Cell counter Horiba). Every procedure was carried out in accordance with the haematology analyser's protocol and standard operating procedures.

Study subjects :

Patients who came to the lab for a CBC analysis served as the study subjects; anaemic patients were chosen from among them in order to determine the prevalence and conduct additional research on anaemia. Patients undergoing various clinical evaluations at the Referral hospital's outpatient departments served as the study subjects. On average, the Referral hospital's OPD laboratory completes 30 to 40 CBC examinations every day. Out of the 3656 CBCs completed during the data collection period (March, April, May, June , July and august 2024), 519 anaemic individuals were chosen for additional examination and research. Carried out in accordance with haematology analyser methodology and normal operating procedures.

Study design :

Study type : Patients who came to the lab for a CBC investigation were the subjects of the cross-sectional laboratory-based study. Method of sampling:(16) Convenient sampling was employed. Every day, every patient with a CBC result was taken into account. They recruited participants one after the other. After that, anaemia patients were chosen, and the prevalence was determined by taking the total number of CBC patients during the study period. Patients who came to the lab served as study subjects.

RESULT

The study took into account 519 anaemic patients in total. Of these, 91% were female, and the majority were between the ages of 25 and 31. In the study area, anaemia prevalence was 14.1% overall. According to this study, the majority of cases (68%) had moderate anaemia, whilst moderate-severe anaemia was present in 18.0 and severe anaemia in 14% of patients, respectively. Both boys and females had the greatest levels of moderate anaemia. Females are far more likely than males to have moderate anaemia. However, males are significantly more likely than females to have severe anaemia [Table 1]. Compared to moderate – severe and severe anaemia, and even to the combination of the two (moderate to severe), moderate anaemia is far more common in the study population. In general, as people age, the prevalence of moderate anaemia rises, whereas the prevalence of moderate - severe and severe anaemia falls (Fig. 1).

44% percent of the anaemias were normocytic, while 43% and 13.4% were microcytic and macrocytic, respectively, according to the MCV. However, according to the MCH readings, 47.5% of the patients had hypochromic anaemia. Nonetheless, normochromic anaemia was seen in 30% of the anaemic participants. (Table 1)

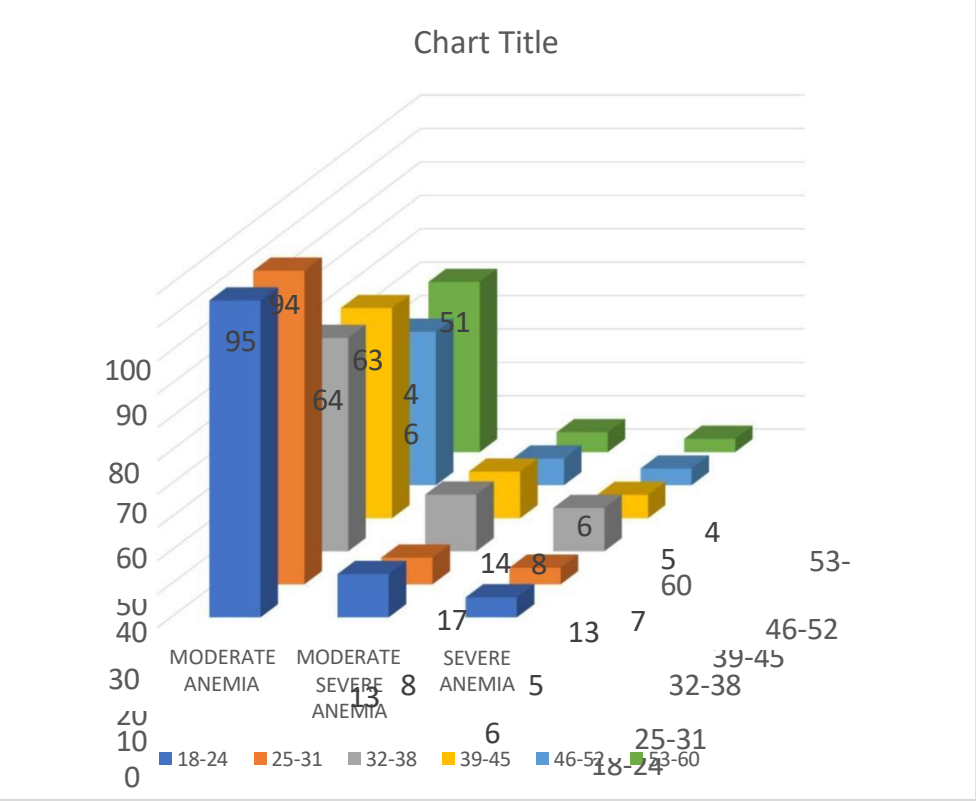
STUDY SUBJECTS			N%	HB LEVAL OF ANEMIA					
				MODERATE ANEMIA		MODERATE - SEVERE ANEMIA		SEVERE ANEMIA	
				7-10 g/dl	N%	5-7 g/dl	N%	BELOW 5g/dl	N%
TOTAL ANEMIC PATIENTS - 519			**14.10%**	**413**	**79.50 %**	**66**	**13%**	**40**	**8%**
AGE	18-24	114	22%	95	83.30 %	13	11.40%	6	5.20%
	25-31	107	21%	94	88%	8	7%	5	7%
	32-38	94	18.10%	64	68%	17	18.00%	13	14%
	39-45	84	16.10%	63	75%	14	17%	7	8.30%
	46-52	59	11.30%	46	78%	8	14%	5	8.40%
	53-60	61	12%	51	84%	6	10%	4	6.50%
GENDER	**FEMALE**	**361**	**69.50%**	**304**	**84.20 %**	**35**	**10%**	**22**	**6%**
	MALE	**158**	**30.40%**	**109**	**69%**	**31**	**20%**	**18**	**11.30%**
MCV	<80.0	222	43%	169	76.10 %	33	15%	20	9%
	80.0-100.0	227	44%	198	87.20	15	7%	14	6.10%

					%				
	>100.0	70	13.40%	46	66%	18	26%	6	8.50%
MCH	<27.0	247	47.50%	192	78%	36	14.50%	19	8%
	27.0-32.0	154	30%	139	90.20 %	8	5.10%	7	4.50%
	>32.0	118	23%	82	69.40 %	22	19%	14	12%

Table 1 Prevalence of moderate, moderate - severe and severe anaemia by study subject.

NOTE : All participate were aged 18 to 60 years.

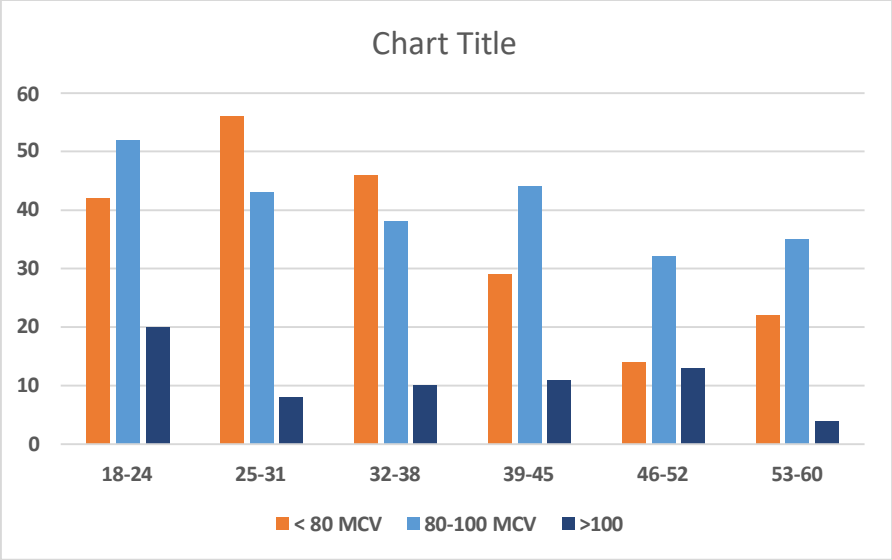
Fig 1.



As shown in Table 1 ,The majority of the anaemic people had normal MCVs, indicating that normocytic anaemia was the most prevalent type among the study participants. Although 30% of the anaemic participants in the same group had a normal MCH, they also reported having normochromic anaemia. Consequently, this study showed that normocytic normochromic anaemia was the most common kind among the study population. Additionally, this study revealed that 43% of the participants had microcytic anaemia (MCV < 80fl), and 47.5% of the participants had lower MCH values, indicating that hypochromic microcytic anaemia was the most prevalent type of anaemia in the study group. However, the research group's proportion of people with macrocytic anaemia was lower. It revealed that 13.4% of research participants had an MCV
>100.

The bulk of cells (87.2%) in moderate anaemia are normocytic. The bulk of cells in moderate-severe anaemia (15%) are microcytic. The majority of cells with severe anaemia (9%) are microcytic, while fewer cells are normocytic and macrocytic. Similarly, the bulk of cells (90.2%) with moderate anaemia are normochromic. The majority of cells (14.5%) in moderate-severe anaemia are hypochromic. The majority of cells (8%) in severe anaemia are hypochromic. (Table 1)

The most prevalent anaemia in this study was normocytic and macrocytic, which primarily affects adults between the ages of 18 and 24. The 25-31 age group of patients is more likely to have microcytic and anaemias. Normocytic anaemia is more common than microcytic and macrocytic anaemia in all age groups. (fig 2).



Prevalence of normocytic, normochromic and macrocytic anaemia by age

Conclusion

The study group had a significant anaemic prevalence. The study found that the area has a considerable frequency of various forms of anaemia. Better treatment practices in underdeveloped nations with limited resources are made possible by the CBC's ability to diagnose and categorize anaemia into its main components. It is unable to identify and validate different forms of anaemia, though, therefore more research techniques are necessary for accurate anaemia diagnosis and categorization, as well as for improved anaemic patient care and monitoring.

References

1. WHO. Haemoglobin concentrations for the diagnosis of anaemia and assessment of severity. Vitamin and Mineral Nutrition Information System. Geneva, World Health Organization, 2011 (WHO/NMH/NHD/MNM/11.1)
2. Milman N. Anaemia—still a major health problem in many parts of the world! Ann Hematol. 2011;90(4):369–77.
3. Kassebaum NJ, Jasra Saria R, Naghavi M, Wulf SK, Johns N, Lozano R, et al. A systematic analysis of global anaemia burden from 1990 to 2010. Blood. 2014;123(5):615–24.
4. Nutritional Requirements throughout the Life Cycle. 2020;3. [Available from: https://nutritionguide.pcrm.org/nutritionguide/view/Nutrition_Guide_for_Clinicians/1342043/all/Nutritional_Requirements_throughout_the_Life_Cycle. [Google Scholar
5.C.M. Pfeiffer *et al.* Trends in blood folate and vitamin B-12 concentrations in the United States, 1988-2004
6. Hallberg L, Högdahl AM, Nilsson L, Rybo G. Menstrual blood loss – a population study. Variation at different ages and attempts to define normality. Acta Obstet Gynecol Scand. 1966; 45: 320–51.
7. Llewellyn-Jones D Severe anaemia in pregnancy (as seen in Kuala-Lumpur, Malaysia). Aust N Z J Obstet Gynaecol, 5 (1965), pp. 191-197
8. L. Babiuk Viral-bacterial synergistic interactions in respiratory infections.

9. Stauffer ME, Fan T. Prevalence of anemia in chronic kidney disease in the United States. PLoS One. 2014;9(1):e84943.

10. M.C. Thomas The high prevalence of anemia in diabetes is linked to functional erythropoietin deficiency. Semin Nephrol(2006)

11. Umanath K, Lewis JB. Update on diabetic nephropathy: core curriculum 2018.Am J Kidney Dis201871884–95

12. Cockerham WC. Health lifestyle theory and the convergence of agency and structure. J Health Soc Behav. 2005;46(1):51–67.

13. Zhang Q-L, Zhao L-G, Zhang W, Li H-L, Gao J, Han L-H, Zheng W, Shu X-O, Xiang Y-B. Combined impact of known lifestyle factors on total and cause-specific mortality among chinese men: a prospective cohort study. Sci Rep. 2017;7(1):5293

14. ManNucci, P.M.; Franchini, M. Health effects of ambient air pollution in developing countries. Int. J. Environ. Res. Public Health 2017, 14, 1048

15. Cohen, A.; Anderson, H.R.; Ostro, B.; Pandey, K.D.; Krzyzanowski, M.; Künzli, N.; Gutschmidt, K.; Pope, A.; Romieu, I.; Samet, J.M.; et al. The Global Burden of Disease Due to Outdoor Air Pollution. J. Toxicol. Environ. Health Part A 2005, 68, 1301–1307.

16. Elfil M., Negida A. (2017). Sampling methods in clinical research: An educational review. Emergency, 5 (1), Article e52, 1–3.