

Original Article

Prevalence of Anaemia at a Tertiary Care Center in India

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Abstract

Background: Anaemia is an important health indicator found common in all ages due to deficiency of iron, acute and chronic blood loss, parasitic infections affecting Red Blood Cells production and survival which may cause anaemia.

Method: Study was conducted on 71309 anaemic patients at Bhaktivedanta hospital and Research Institute, Thane Maharashtra India. Hemoglobin and packed cell volume values were analyzed based on gender, age groups (20-40 years, 40-60 years and 60-80 years).

Result: one third of men and two third of women in the given study population were seen to be anaemic of variable disease.

Conclusion: Prevalence and extent of anaemia irrespective of the etiology affects disease outcome in all acute and chronic conditions, whether it is surgical wound healing, heart failure, diabetic foot ulcers etc.

Adequate medical and dietary management of anaemia should be conjoint approach in any disease management strategy by the healthcare professionals along with the presenting medical surgical condition. Study also highlights the need of attention towards anaemia in male as well.

Keywords: Anaemia, Male Anaemia, Female anaemia, prevalence of anemia, Hemoglobin concentration, Packed Cell Volume, severity of anaemia.

Introduction

Anaemia is one of the most common concerns of global healthcare that is also a very common condition in India. Anemia is an abnormal physical

and hematological condition that is associated with a lack of oxygen carrying capacity of the RBC and subsequent reduced oxygenation of the peripheral tissues.¹

Iron deficiency is the primary cause and the contribution of B12 deficiency is the major cause of anaemia followed by folate deficiency. The presence of other micro nutrient deficiencies, including vitamins A, riboflavin, copper and zinc can increase the risk of anaemia. Other causes of anemia, excessive blood loss as a result of menstruation, or parasitic infections can

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lower blood hemoglobin (Hb) concentrations.²The objective of this study is to determine the prevalence of anemia in men and women.

Material & Methods

Study Design and population

This is a cross-sectional, retrospective study carried out from December 2018 to December 2020 at Bhaktivedanta Hospital and Research Institute, Thane, Maharashtra India. Bhaktivedanta The study was initiated after obtaining approval from the Institutional Ethics Committee and approval from the Ministry of Health (EC/NEW/INST/2019/245)

Eligibility Criteria

Inclusion Criteria included age group of 20 years to 80 years, both gender, having haemoglobin level below 13 g/dl and packed cell volume below 39%. Patients below 20 years were excluded from the study.

Procedures

This retrospective study was conducted on pathology laboratory finding data of complete blood count (CBC) for 71309 anaemic patients aged between 20-80 years of both gender. Hemoglobin and packed cell volume values for these patients, of Bhaktivedanta Hospital and research Institute Thane, Maharashtra India, were evaluated.

Hemoglobin determination procedure recommended by the International Committee for Standardization of Hematology was followed as per the supervision of the Iron Reference Center.³The

World Health Organization uses Haemoglobin (Hb) threshold for the diagnosis of anemia. The prevalence of anaemia was grouped by age and gender.⁴

The anemia was defined in men (15 years of age and above) when Hb levels 13.0 g/dl or higher reflecting normal condition, 11-12.9 g/dl reflecting mild anaemia, and 8-10.9 g/dl reflecting moderate anaemia, and lower than 8 g/dl reflecting severe anaemia. The anemia was defined in women (15 years of age and above) when Hb levels 12.0 g/dl or higher reflecting normal condition, 11-11.9 g/dl reflecting mild anaemia, and 8-10.9 g/dl reflecting moderate anaemia, and lower than 8 g/dl reflecting severe anaemia.^{5,6,7}

The anaemia was defined in men (15 years of age and above) when packed cell volume (PCV) levels 39.0% or higher reflecting non-anaemia, 33-38.7% reflecting mild anaemia, 24-32.7% reflecting moderate anaemia, and lower than 24% reflecting severe anaemia.⁸The anaemia was defined in women (15 years of age and above) when packed cell volume (PCV) levels 36.0% or higher reflecting non-anaemia, 33-35.7% reflecting mild anaemia, and 24-32.7% reflecting moderate anaemia, and lower than 24% reflecting severe anaemia. The WHO recommended hemoglobin values that could be considered anemia in which the hemoglobin level is lower than the figures given below. The values given are in g/dl. The packed Cell Volume values related to the concentration of hemoglobin given above can be obtained by multiplication. The value of PCV is three times higher than the value of hemoglobin.⁹ (Table-1)

Table 1: Haemoglobin (g/dl) standard reference & Packed Cell Volume (%) Levels used to Diagnose Anaemia

		Anaemia							
		Non-Anaemia		Mild		Moderate		Severe	
Age group Prevalence		Men	women	Men	Women	Men	Women	Men	Women
15 years of age and above	Hb (Range)	13 or higher 13.0	12 or higher 12.0	11-12.9	11-11.9	8-10.9	8-10.9	lower than 8	lower than 8
15 years of age and above	PCV (Range)	39.0 or higher	36.0 or higher	33-38.7	33-35.7	24-32.7	24-32.7	lower than 24	lower than 24

Statistical Analysis

Data were analyzed using Statistical Package for Social Sciences version 22.0. We analyzed age standardized prevalence using sampling for men and women and additionally age distribution of the Indian Population.

Role of funding source

The funder of the study had no role in the study design, data collection, data analysis, data interpretation or writing of the report. The corresponding author had full access to all the data in the study and had final responsibility for the decision to submit for publication.

Results

The main purpose of our study was to identify the prevalence of anaemia in male and female. Study also aimed to evaluate anaemia as per age groups. A total 71309 anaemic patients aged group of 20-80 years were studied for the prevalence of anaemia, of which 24931 (35%) were men and 46378 (65%) were women for whom haemoglobin and packed cell volume were analyzed.

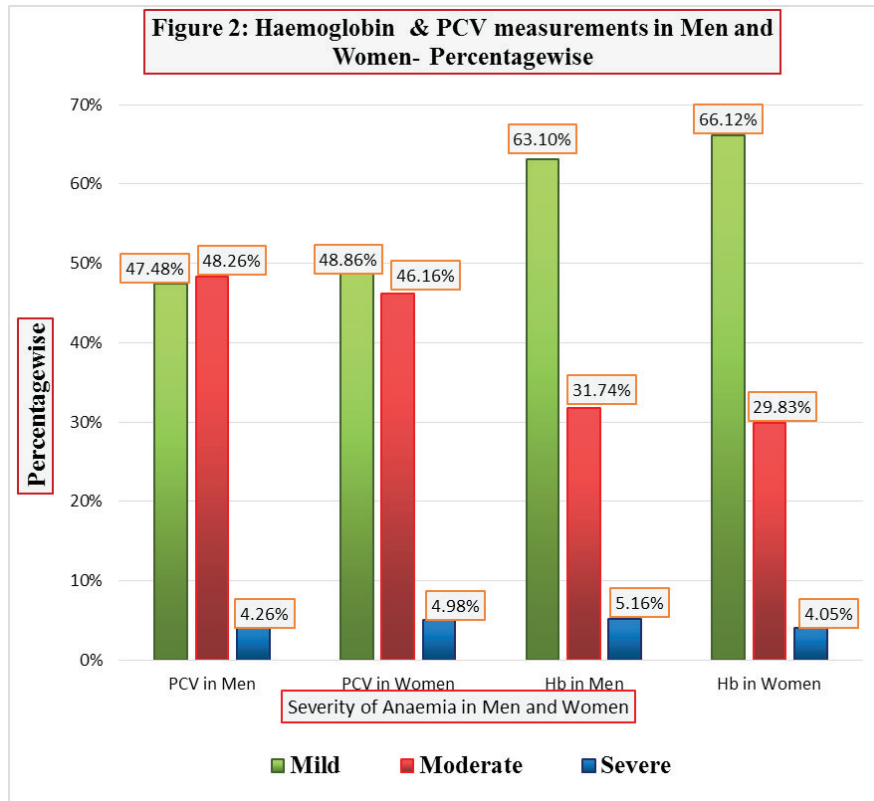
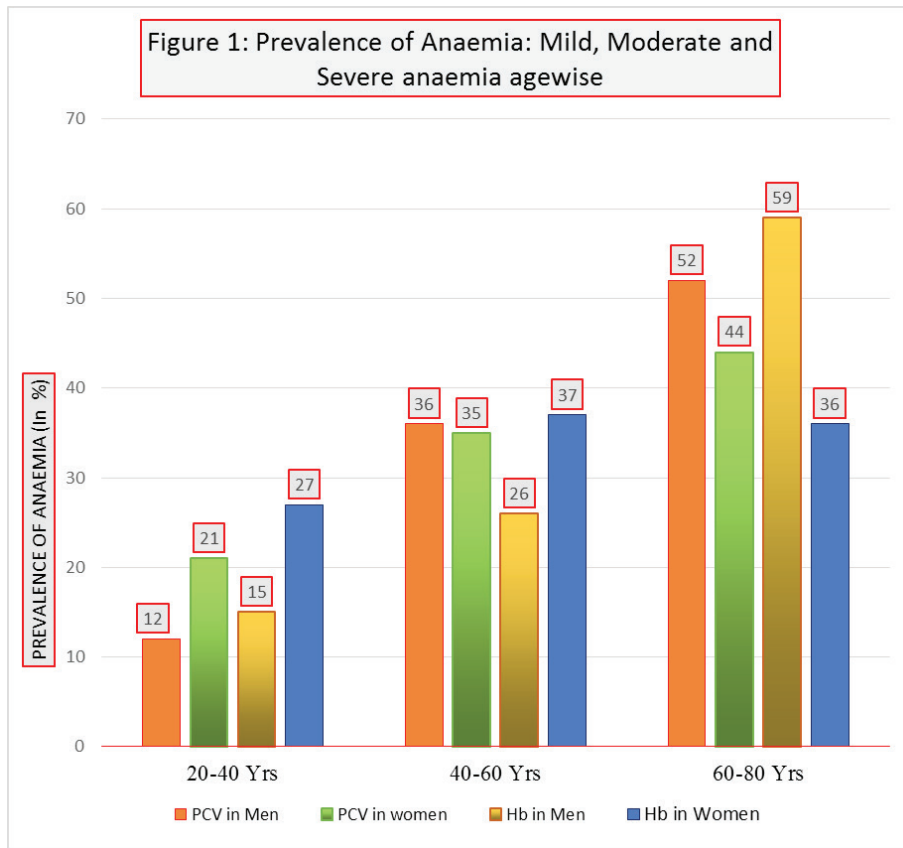
Our present study estimated severity of anaemia based on Haemoglobin level and PCV measurements as depicted in table 2 and figure 2.

Table 2: Distribution of severity of anaemia, by gender and age group

	Anaemia					
	Mild		Moderate		Severe	
Population	Men	Women	Men	Women	Men	Women
Hb Level	11-12.9	11-11.9	8-10.9	8-10.9	< 8	< 8
Age (20-40 Yrs)	2306 (69%)	7973 (71%)	888(26%)	2938 (26%)	155 (5%)	396 (3%)
Age (40-60 Yrs)	3650 (62%)	10241 (66%)	1866 (32%)	4617 (30%)	369 (6%)	601 (4%)
Age (60-80 Yrs)	8088 (62%)	9616 (63%)	4311 (33%)	4999 (32%)	625 (5%)	708 (5%)
PCV level	33-38.7	33-35.7	24-32.7	24-32.7	< 24	< 24
Age (20-40 Yrs)	135 (44%)	470 (53%)	156 (50%)	372 (42%)	18 (6%)	46 (5%)
Age (40-60 Yrs)	494 (51%)	780 (52%)	428 (44%)	625 (42%)	51 (5%)	89 (6%)
Age (60-80 Yrs)	640 (46%)	845 (44%)	706 (51%)	983 (52%)	45 (3%)	79 (4%)

Present study estimated prevalence of anaemia by PCV concentration in men and women (20–40 years) were 309 (12%) and 888 (21%). Men and women (40-60 years) were 973 (36%) and 1494 (35%). Men and Women (60-80 years) were 1391 (52%) and 1907 (44%).

We estimated prevalence of anaemia through Haemoglobin (Hb) measurements in Men and Women (20-40 years) were 3349 (15%) and 11307 (27%). Men and women (40-60 years) were 5885 (26%) and 15459 (37%). Men and women (60-80 years) were 13024 (59%) and 15323 (36%). (Figure 1)



Discussion

The prevalence of any anaemia increases with age, affecting elderly quite often.¹⁰ Present study evaluation was based on WHO criteria for anaemia which is based on haemoglobin and PCV concentration in adults.

This is one of the largest sample size study which included 71309 anaemic subjects. India has made great efforts to prevent anaemia. In particular, National Nutritional Prevalence Programme provides a free program of anaemia prevention, which has been involved in family planning services through primary health care since its inception in 1970.¹¹

The overall prevalence in study conducted in north Indian population in year 1994 among women aged 20-40 years was 70.1%.¹² It is worth noting that there is no change in the last 27 years in the incidence and prevalence of anaemia.

According to our study, the prevalence of anaemia in women in the age group of 20-40 years was 65%. Present study shows 34% Moderate anaemia and 5% severe anaemia in the age group of 20-40 compared to 31% Moderate anaemia and 4% severe anaemia in the age group of 60-80 years. (Figure-1).

Anaemia among men and women is an important public health issue that has not received much research and policy attention so far.¹³ Healthcare Professionals and Policymakers should consider expanding existing efforts to reduce anaemia not just in women but also to men.¹⁴

Prevalence and extent of anaemia irrespective of the etiology affects disease outcome in all acute and chronic conditions, whether it surgical wound healing, heart failure, diabetic foot ulcers etc. one third of men and two third of women in the given study population were seen to be anaemic of variable disease.

Limitations of the study: Interpretations of the study need to be studied in the light of following limitations of the study. Study is retrospective in nature with very limited clinical correlation .

Ethical Considerations: Approval from in-house Institutional Ethics Committee was taken before initiation of study.

Conflict of Interest: None declared

Source of Funding: None

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