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Original Research Article

Study of haemoglobin levels among working women in Kancheepuram district Tamil Nadu

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ABSTRACT

Aim: To study the haemoglobin levels among middle aged working women in kancheepuram district tamilnadu

Objectives: To assess the haemoglobin levels in working women of age group ranging from 25 to 65 years using hemocue 301 analyser. To analyse the clinical signs and symptoms, grade the anemia and to find the association with nutritional and socio economic status of the participants.

Materials and Methods: We studied the haemoglobin levels of 198 working women of age group ranging from 25 to 65 years using hemocue 301 analyser. Women were the residents of Kovur, Kancheepuram district, Tamilnadu.. Institutional ethical committee clearance was obtained. We assessed the Hb level in capillary blood by finger prick method using disposable single use sterile lancets.

Observations and Results: We observed that 31% of our study participants hemoglobin values less than 12g/dl. We observed that 14% of women had mild anemia, 16% had moderate anemia and 1% had severe anemia.

Conclusion: Prevalence of anemia among working women is high in India. Haemoglobin status of women is influenced by their diet, working environment, socio economic status and other associated diseases. We emphasize through our study on routine screening women for anemia and Iron and Folate supplements should be given to them frequently .

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1. Introduction

Anemia is the most common haematological disease of women world-wide. Anemia is defined as deficiency of haemoglobin < 12g/dl as per world health organisation recommendation.¹ Haemoglobin, the iron containing metalloprotein in the red blood cells transport oxygen from lungs to rest of the body.²

2. Materials and Methods

We studied the haemoglobin levels of 198 working women of age group ranging from 25 to 65 years using hemocue 301

analyser. The study was conducted during 2022. Women were the residents of Kovur, Kancheepuram district, Tamil Nadu. They participated voluntarily. Institutional ethical committee clearance was obtained. We assessed the Hb level in capillary blood by finger prick method using disposable single use sterile lancets.

Haemoglobin (Hb) test was done using the HemoCue Hb 301+ analyser which is recommended by WHO for giving accurate results.¹ We assessed the Hb level in capillary blood by finger prick method using disposable single use sterile lancets.

Test principle: The principle of the test is sodium deoxycholate inside the microcuvette haemolyses the red blood cells releasing haemoglobin. Sodium nitrite

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then converts the haemoglobin to methemoglobin which, together with sodium azide, gives azide methemoglobin. The absorbance of the sample is measured at two wavelengths (570 and 880 nm) in order to compensate for turbidity in the sample. The haemoglobin level is then calculated by the meter and displayed on the screen.

Test procedure: Wash hand with warm soapy water and dry thoroughly prior to collecting samples. The microcuvettes are stored at room temperature. The microcuvette is for single use only. The HemoCue Hb 301+ instrument is calibrated against the international reference method for haemoglobin determination, ICSH3. Follow the test procedure from 'Applying blood to the cuvette' fill the microcuvette in one continuous process. Make sure the patient's hand is warm and relaxed. Use only the middle or ring finger for sampling and avoid fingers with rings on. Clean finger with disinfectant and allow to dry. Using your thumb, lightly press the finger from the top of the knuckle towards the tip. This stimulates the blood flow towards the sampling point. For best blood flow and least pain sample at the side of the fingertip, not in the centre. Whilst pressing lightly towards the fingertip, prick the finger using a lancet. Wipe away the first two or three drops of blood. Re-apply light pressure towards the fingertip until another drop of blood appears. When the drop is large enough, fill the microcuvette in one continuous process, filling from the tip of the microcuvette. Do not refill. Inserting the cuvette. Make sure no blood is drawn out of the microcuvette during this procedure. Insert cuvette into the meter. Place the filled microcuvette in the cuvette holder. Testing should be performed within 10 minutes from filling the microcuvette. Push the cuvette holder to its measuring position. After 15-60 seconds the haemoglobin value of the sample is displayed. Once the test is completed, discard the used microcuvette in the biomedical waste dustbin.

Hemoglobin status of the working women were analysed thoroughly and a report was generated. Hb values are analysed and the prevalence of anemia among working women is calculated [table 1]. Based on Hb values anemia is graded as mild, moderate and severe [table 2] and public health significance was categorised [table 3].

3. Observations and Results

We observed that 31% of our study participant's hemoglobin values less than 12g/dl. Women complained of easy fatigability, hair loss, pallor, dyspnoea, palpitation and recurrent infections. 14% of women had mild anemia, 16% had moderate anemia and 1% had severe anemia.

4. Discussion

Anemia is a global public health problem affecting women of all age groups in both developing and developed countries. India has one of the highest global prevalence

Table 1: Percentage of anemia in working women in the age group of 25-65 years

S.No.	Total number of women examined of age group 30 -65 years	198
	Number of anemic females haemoglobin < 12g/dl	62(31%)

Table 2: Grading of anemia among working women of age group 25 -65 years¹

S.No.	Grading of anemia		%
1.	Total number of anemic women (Hb <12g/dl)	62	31
2.	Mild anemia (Hb 11-11.9 g/dl)	28	14
3.	Moderate anemia (Hb 8-10.9 g/dl)	32	16
4.	Severe anemia (Hb <8g/dl)	2	1

Table 3: Table 3: Classification of public health significance of anaemia in populations on the basis of prevalence estimated from blood levels of haemoglobin \$¹

Category of public health significance	Prevalence of anaemia (%)
Severe	40 or Higher
Moderate (our study lies in this category with prevalence 31%)	20- 39.9
Mild	5- 19.9
Normal	Less than 4

(53%) of anemia among women of reproductive age group (15-45 years).³ Anaemia is a major public health issue in India today. The prevalence for anemia among women and children of India are high.⁴ According to WHO, anemia is defined as haemoglobin levels < 12g/dl in women and < 13g/dl in men. However normal haemoglobin distribution varies with sex, ethnicity and physiological status. Etiopathogenesis of anemia is often multifactorial.⁵ The cause of anemia in women can be dietary deficiency of iron & folate, menstrual blood loss, Worm infestation, increased red cell destruction, impaired red cell production etc.⁶ Anemia affects work performance, cognitive function, immunity and thermoregulation. Laboratory investigations play a vital in diagnosing anemia and follow up.⁷

The common signs and symptoms of anemia are pallor of skin, tongue and nails. Pale lower palpebral conjunctiva, spoon shaped nails causing koilonychia, pica (eating strange foods), easy fatigability, hair loss, dyspnoea, palpitation and dysphagia.⁸

Common complications of anemia are tiredness, cardiovascular failure, tachycardia, recurrent respiratory tract infections, restless leg syndrome. Pregnant women who are anemic have increased risk of developing complications like premature delivery, low birth weight babies, post natal depression and cardiovascular failure.⁹

We conducted health camps in our neighbourhood areas and screened the women for anemia. We have given them

iron and folate supplements. We advised anemic women to approach the nearby hospital for lab investigations and proper treatment.

5. Conclusion

Prevalence of anemia among working women is high in India. In our study we found the prevalence of anemia among working women of age group 25-65 years to be 31%. Haemoglobin status of women is influenced by their diet, working environment, socio economic status and other associated diseases. We emphasize through our study on routine screening women for anemia and Iron and Folate supplements should be given to them frequently. This study was conducted to create an awareness among women about anemia and also to improve the hemoglobin status of women population. Noval intervention program and strategies are needed to improve the overall nutrition status of women. It can be done by organised, tailored programs by government across various socio-economic groups.

6. Conflict of Interest

None.


7. Source of Funding

None.

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