

Reducing the burden of Anemia: A cost effective sensitive method assessed among women attending post-partum clinic in an urban health centre



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ABSTRACT

Background: Detection and early intervention of anemia in vulnerable population is of paramount importance in public health. Due to higher prevalence of anemia in women especially those who have just delivered and are breast feeding, this study would be of importance. **Aims and Objective:** This study was conducted in this population to find out the validity of clinical examination as an effective screening tool. **Materials and Methods:** Screening for anemia was conducted in study population by two members of health care providers (doctor and health worker). Results were compared with a gold standard. Standard guidelines were used to classify anemia as mild moderate and severe based on hemoglobin levels. Three sites were clinically examined for anemia and depending on pallor were graded as no, some, or severe pallor. Site wise sensitivity and specificity were considered. **Results:** Sensitivity of detecting anemia by clinical examination was 84.3 % by health worker and 64% by doctor. The specificity was 42.8% by health worker and 81.2% by doctor (inter observer agreement was 0.31 or fair). Diagnosing anemia by pallor in lower palpebral conjunctiva had a sensitivity of 66% for both some and severe anemia while that of palmer surface for severe anemia was 33% and moderate anemia was only 23%. On examining oral mucosa for the same purpose severe anemia had a sensitivity of 33% whereas moderate anemia yielded 66% and combination of all the three sites as described earlier had a sensitivity of 64%. **Conclusion:** The method of clinical examination as a screening tool for detecting anemia at field level holds good. However, examination of two or more sites should be advocated.

Key words: Anemia; Site; Sensitivity; Specificity

INTRODUCTION

Anemia is one of the most easily preventable conditions affecting public health. It is a silent disaster gently undermining the quality of life without any overt symptoms. Yet its mute appeal can easily be seen in the down cast eyes or upturned hands of the hapless women medically known as lower conjunctival pallor and palmer

rubor. Anemia evolves through many grades affecting cardiovascular and nervous system manifesting as fatigue, breathlessness and dizziness. But far before anemia makes its presence felt it can easily be seen, arrested and reverted to normalcy. This requires routine examination of all vulnerable subjects like pregnant women, breast feeding women, adolescents by health care personnel's to identify earliest sign and intervene. About 63% of the breast fed

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women in India is anemic.¹ This may be due to lack of nutrition or reluctance to consume iron, folic acid following childbirth, etc. Thus this section of the population forms a very good study subject to find out a cheap method to detect anemia. Anemia can be tested or quantified by testing blood in the laboratory by various methods.

Mere clinical examination causing early detection and prevention forms the spine of public health, which finds its excellent application in anemia prevention. If a procedure as easy and cheap as, mere clinical surveillance yields a good result in detecting anemia, such practice should be endorsed. A health worker examines more of normal population and her ability to sieve through the normal and detect the diseased is of paramount importance. With these objectives in view a study was conducted to

1. Find out the efficacy of clinically detecting anemia by a health worker (a representatives of healthcare catering to large number at field level) and its comparability with a clinic based doctor (representing a healthcare worker attending to smaller number of subjects)
2. Site wise the best place to detect anemia by clinical examination was sought in a population of women attending post-partum clinic.

MATERIALS AND METHODS

An observational study was conducted in an Urban Health Centre in Kolkata for a period of 6 weeks on all women having children between 0-23 months attending the said clinic during the study period. Iron supplementation was given to all subjects irrespective of status as per Nutritional Anemia Prevention Programme. The study was pre-approved by the Institutional ethical committee of All India Institute of Hygiene and Public Health before embarking.

Considering a prevalence of 63%¹ and allowable error 10% sample size was 97. Sampling was done as total enumeration of all women attending post-partum clinic of the urban health center for 4 weeks. Effective sample size was 106.

Inclusion criteria were women attending the post-partum clinic with having a child within 2 years of age and willing to participate.

Exclusion criteria: women having any blood disorder known and any cardiovascular disorder known were excluded.

Methodology

All women attending post-partum clinic of urban health centre of All India Institute of Hygiene and Public Health on and were willing without exclusion criteria was included in the study.

Each subject was clinically examined at three sites separately by a two members of health care system after they consented to the procedure. Firstly, the health worker ideally caters to general population (representative of a screener of submerged iceberg) and doctor examining the diseased representing the tip of the iceberg attending the health care system.

Next all the subjects were tested in the same urban health center laboratory for hemoglobin level to establish the gold standard (a routine procedure). The criteria were fixed as < 8 mg/dl was considered as severe anaemia,² between 8.1- 11.9 mg/dl was considered moderate anaemia³ and above 12 mg/dl was considered as normal.⁴

Clinically the subjects were classified as some pallor, severe pallor or no pallor accordingly three sites examined for site wise sensitivity were lower palpebral conjunctiva, palmer surface and oral mucosa. Each site was graded as no, some, severe pallor. General diagnosis was given according to grade obtained by most number of sites (2 out of 3).

RESULT

In this study of the two separate observers sensitivity of detecting anemia by clinical examination were 84.3 % by health worker and 64% by doctor. The specificity had an almost reverse picture of 42.8% by health worker and 81.2% by doctor (interobserver agreement was 0.31 or fair) (Table 1).

A low specificity rate in detection by health worker indicates that she is likely to label a non-anemic person as anemic. Other than providing Iron supplements to these subjects, which cause no harm to the subject or not much damage is occurring from a public health view point. On the other hand, a high sensitivity indicates that she is not missing much of pathological cases and is administering Iron to these cases where it is essential. This is very important for preventive medicine where bulk management is the prerogative rather than individual treatment.

A higher specificity in case detection by doctor ensures that the cases referred to specialist in case of doubt of the

Table 1: Comparison of detection of anemia by two independent observers

Category of Observer	Sensitivity	Specificity	Sensitivity for some pallor / moderate anemia	Sensitivity for severe pallor / severe anemia
Health Worker	84.3%	42.8%	85%	100%
Doctor	64%	81.2%	66%	100%

health worker are better diagnosed. After first lot sieving by health worker a limited number generally are referred to the doctors. However in this study both the participants examined all the study subjects. When grade wise sensitivity of clinical diagnosis of anemia as detected by two observers was sought it was seen that severe anemia was diagnosed completely or sensitivity was 100% by both the observers. Moderate anemia detection had a sensitivity of 85% and 65% by health worker and doctor respectively (Table 1).

Site wise as well as grade wise detection was done by the doctor only in this study owing to the time constraints of the health worker. Conjunctival pallor was more useful in detecting both some and severe pallor.

Diagnosing anemia by pallor in lower palpebral conjunctiva had a sensitivity of 66% for both some and severe anemia while that of palmer surface for severe anemia was 33% and moderate anemia was only 23%. On examining oral mucosa for the same purpose severe anemia had a sensitivity of 33% whereas moderate anemia yielded 66% (Table 2). Combination of three sites as described earlier had a sensitivity of 64%.

DISCUSSION

In our study conjunctival pallor had the highest sensitivity in detecting both severe and moderate anemia. Similarly, in a study in Japan by Chalco JP et al.,⁵ the sensitivity in detecting severe anemia in lower palpebral conjunctiva was 70% and moderate anemia was 43% versus a sensitivity of 66% for both grades of anemia in our study.

Oral mucosa examination for severe anemia detection had a sensitivity of 80% in the mentioned study⁵ versus 33% in our study. But for moderate anemia the sensitivity was 39% in their study versus 23% in our study.

Considering the sensitivity and specificity in detecting anemia clinically by doctor and health worker separately we find that a study conducted by Royal Society Of Tropical Medicine And Hygiene⁶ by 2 observers in Africa both being health workers showed a sensitivity of 62% and 69% and a specificity of 87% and 77% whereas that of health workers assessment in this study which was 84.3% and 42.8%.

Table 2: Site wise sensitivity of detection of different grades of anemia

Grade	Lower palprebral conjunctiva	Palmer rubour	Oral mucosa
Severe	66%	33%	33%
Some/Moderate	66%	23%	66%

Observation by Thaver IH, Baig L⁷ yielded a sensitivity of 74% and specificity of 96% of detecting anaemia clinically compared to our study where the sensitivity of the doctor in detecting anemia was 64% and specificity was 81%.

Yet another study conducted by Spinelly MG et al.,⁸ found out conjunctival pallor to be most useful for anemia detection similar to our study. However, Getaneh T et al.,⁹ found palmer pallor to be most sensitive in his study. It is to be kept in mind that food habits in Indians particularly Bengali women who cook and eat with their hands tend to give a yellowish tinge to 'their palm affecting the true judgement of the observer. Thaver IH, Baig L⁷ in their study concluded examination of more than one site yielded better result similar to our study.

CONCLUSION

It may be concluded that the method of clinical examination as a screening tool holds good. However, examination of two or more sites should be advocated. Despite the fact that different National program targets to provide iron supplementation to vulnerable groups the country wise prevalence shows that much work is desired in this area. Not only supplementation those cases which need pharmacological, clinical support have to be identified from the masses. More research should be targeted for development of field level equipment to fine tune the detection methods.

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