

Research paper

How good is the quality of antenatal care in the Colombo district of Sri Lanka in diagnosing and treating anaemia?

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ABSTRACT

Background Sri Lanka has shown relatively good maternal outcome indicators for a developing country. However, high maternal deaths from haemorrhage and anaemia raise questions about the quality of detection and treatment of anaemia at field antenatal clinics, which is the primary care setting for pregnant women.

Aim The aim of the study was to assess the quality of facilities and services and how satisfactory antenatal care is with regard to diagnosis and treatment of anaemia.

Methods This study was set in field antenatal clinics and conducted in two stages based on the Lot Quality Assurance Sampling method. In the first stage 55 antenatal clinics were selected, and in the second stage 275 pregnant women were recruited from these 55 clinics. Quality of services and quality of facilities were assessed using observation, and an interviewer administered questionnaire was used to measure client satisfaction. The validity of haemo-

globin colour scale results was investigated by comparing them with results from a quality assured laboratory.

Results Eleven health areas, other than the seven areas which had the haemoglobin investigated, were unacceptable as regards the quality of services. The quality of facilities was better than the quality of services in the Colombo district. Information and counselling was provided for only 4% of women in the clinics. The sensitivity and the specificity for the haemoglobin colour scale was 62% (95% CI: 52.9%–71.1%) and 86% (95% CI: 79.6%–93.0%) respectively.

Conclusion Urgent steps should be taken to improve the quality of care in the health areas where care is substandard, in order to reduce morbidity and mortality due to anaemia.

Keywords: anaemia, field antenatal clinics, maternal health, primary care, quality

How this fits in with quality in primary care

What do we know?

The primary care setting in Sri Lanka for antenatal care is the field antenatal clinic, where most pregnant women register for health care. Many previous studies have reported on quality of prenatal anaemia care, but in settings other than primary care.

What does this paper add?

This study aimed to assess the quality of these clinics for prenatal anaemia care. We assessed quality of care for screening, diagnosis and treatment of maternal anaemia using the Lot Quality Assurance method. This is a sampling method used to review quality and improvements in care. Despite high satisfaction rates, field clinics in the Colombo district provided an inadequate quality of screening, diagnosis and treatment of maternal anaemia. Urgent steps should be taken to improve the quality of care with specific targeting of substandard care in some health areas.

Introduction

'It is the quality of our work which will please God and not the quantity.'

Mahatma Gandhi

Quality antenatal care and early interventions reduce maternal and perinatal mortality.¹ Substandard care has been found to have an influence on the outcome of maternal deaths.² Proper assessment and early diagnosis of anaemia should help healthcare workers to uncover conditions in the mother that may threaten her and the foetus; these conditions should then be treated to ensure better outcomes.³

Field antenatal clinics, as they are termed in Sri Lanka, are similar to primary healthcare centres. The pregnant woman is registered in the field clinic, and assessed for risk factors. Anaemia is clinically diagnosed by the Medical Officer of Health (MOH) in these clinics and investigated using the haemoglobin colour scale. Doctors in tertiary care institutions or hospitals use these findings for further management and treatment. All pregnant women attending these clinics receive iron and folate supplements, free of cost, at each visit.

In Sri Lanka, 98% of pregnant women attend field antenatal clinics and 54% are booked at less than eight weeks gestation.⁴ In order to have sufficient time for treatment, policies emphasise that women should be booked into the clinic before the eighth week of pregnancy to be investigated for complications. In spite of this, the prevalence of anaemia among pregnant women is 34%.⁵ Post-partum haemorrhage is the leading cause of maternal death but anaemia is also ranked among the commonest causes of maternal death.⁶ Disparities between attendance rates at field clinics, the high prevalence of anaemia in pregnancy and high maternal deaths from haemorrhage and anaemia raise questions about the quality of detection and treatment of anaemia in field antenatal clinics.

The aim of this study was to assess the quality of antenatal care with respect to diagnosis and treatment of anaemia. In accordance with Donabedian's definition of quality, the study sought to assess the facilities (structure) and services (process) of field antenatal clinics in the Colombo district, perceived satisfaction of pregnant women attending these clinics (outcome) and the validity of the colour scale.⁷

Methods

A cross-sectional study design was used. Colombo is one of 24 districts in Sri Lanka. The district is divided into 13 MOH areas and in each MOH area pregnant women attend the nearest field antenatal clinic.

Study sample and sample size

Data were collected in two stages. In the first stage, all MOH areas other than the Borelsgamuwa MOH area (which was under the University of Sri Jayewardenepura) and the Pitta Kotte MOH area (which was under the University of Colombo) were included, so that in total 11 MOH areas (85%) were included. In each of the 11 MOH areas, according to the Lot Quality Assurance Sampling (LQAS) method, assuming a 75% test value and 20% anticipated value, at 5% significance level with 90% power, five field antenatal clinics would be needed ($n=55$) and these were randomly selected.⁸ This fulfilled the recommendation to include at least 25% of the healthcare institutions in the area when assessing quality of care.^{9,10}

In the second stage, the sampling unit was pregnant women attending the clinics for the first time. According to the LQAS method, at least five women from each of the clinics should be sampled, and they were invited to participate in the study at their booking visit

to the clinic. Therefore in total, 25 women were recruited in each of the MOH areas ($n=275$).¹¹

Data collection

The research team consisted of the principal researcher and two female research assistants (both medical doctors) who visited the clinics. An introductory meeting was held on the first day in each clinic to establish contact with staff and to explain the aim of the study. The research team was introduced as not coming from the Ministry of Health, and it was emphasised that the findings of this study would by no means be used to criticise any staff member. The principal researcher explained the aim of the study to the recruited women, and consent was obtained from them to withdraw blood for haemoglobin estimation.

Observations for quality of facilities

Before the clinic services began, an observation checklist (the Quality of Facilities in the Field Antenatal Clinic checklist) was used to assess the availability of facilities for detection and treatment of anaemia.¹² The checklist included the presence of a qualified MOH, equipment for the estimation of haemoglobin and availability of haematonic supplements (iron and folic acid).

Observations for quality of services

Once the clinic was in process, a research assistant was placed in the consultation room with the MOH to observe the interaction with the pregnant woman with respect to clinical diagnosis and treatment of anaemia and another research assistant was positioned with the healthcare worker to observe the provision of supplements and assessment of haemoglobin levels.

Using an observation guideline (the Quality of Services in the Field Antenatal Clinic checklist), the observer took notes on whether a clinical examination for anaemia was performed by examining the conjunctiva, whether this was communicated to the woman, whether the haemoglobin colour scale results were conveyed by either the MOH or the healthcare worker and, on provision of supplements, whether advice on improving compliance with taking supplements was provided.¹²

Haemoglobin assessment

To estimate haemoglobin levels, the health workers used the haemoglobin colour scale. A finger-prick drop of blood was placed on a strip of absorbent paper and the colour was compared with a standard colour scale. The observations of the procedure and the haemoglobin levels were recorded.

For research purposes, the observer collected 5 ml of blood to estimate the haemoglobin after explaining the aim and the purpose of the study and obtaining consent from the women. The blood samples were sent to a quality assured laboratory and were analysed using the spectrometry method.

Client satisfaction of care

At the end of the clinic session the 275 women observed were asked individually the following question: 'How would you grade your satisfaction on the adequacy of information that you received regarding i) investigations ii) treatment of anaemia?'

Statistical analysis

A pooled analysis was performed on all 275 women followed by the LQAS. Data were analysed using SPSS version 15. The analysis for quality of services was limited to the number of clinics which had facilities available. The validity of the haemoglobin colour scale was limited to the clinics which had the facility and the services for diagnosing anaemia.

Results

Five pregnant women were observed for quality of services for diagnosing anaemia in each of the 43 clinics which had an MOH ($n=215$) (see Table 1), and 22% of the clinics were excluded due to the lack of availability of the MOH as a clinical examination could not be performed. The haemoglobin colour scale and the strips were available in 40% of clinics, which reduced the number of observations for quality of services for investigation to 110 women.

Among the women observed, 155 (72%) were examined for anaemia, of whom only 62 women (29%) were informed of the signs of anaemia. Ninety-one (83%) women were not informed of their haemoglobin level from the colour scale, and other than for four (4%) women, all others were not advised of their results.

The quality of facilities was unacceptable in seven MOH areas for the three indicators for quality of facilities, whereas for quality of services, other than for the haemoglobin test and provision of supplements, none of the MOH areas were acceptable.

The results obtained from the haemoglobin colour scale were compared with results from the quality assured laboratory. The pregnant women were categorised into two groups 'anaemic' and 'not anaemic' according to the cut-off level of 11 g/dl (see Table 2).⁵ Among the 110 women investigated for anaemia by

Table 1 Quality of facilities and services to detect anaemia in the field antenatal clinics and application of LQAS

	Provision at clinics		MOH areas with unacceptable performance
	Not provided(%)	Provided (%)	
Quality of facilities in the antenatal clinic (n=55 clinics)			
An MOH doctor	12 (21.8)	43 (78.2)	1 MOH area
Haemoglobin colour scale	33 (60.0)	22 (40.0)	4 MOH areas
Availability of supplements	18 (32.7)	37 (67.3)	2 MOH areas
Quality of services for diagnosing anaemia (n=215 women)			
Clinically examined for anaemia	60 (27.9)	155 (72.1)	All MOH areas
Explained findings of anaemia on clinical examination	153 (71.2)	62 (28.8)	All MOH areas
Quality of services for investigating anaemia (n=110 women)			
Haemoglobin performed with colour scale	0 (0)	110 (100)	4 MOH areas
Explained results of her investigation	91 (82.7)	19 (17.3)	All MOH areas
Counselled according to the colour scale results	106 (96.4)	4 (3.6)	All MOH areas
Quality of services for treating anaemia (n=185 women)			
Supplements provided	0 (0)	185(100)	2 MOH areas
Advice on compliance of supplements	172 (93.0)	13 (7.0)	All MOH areas

Table 2 Validity of the haemoglobin test

Haemoglobin obtained at the field ANC	Haemoglobin obtained from the quality assured laboratory		Sensitivity (95% CI)	Specificity (95% CI)	Positive predictive value (95% CI)
	<11 g/dl (%)	≥11 g/dl (%)			
<10 g/dl	13 (54.2)	11 (45.8)	61.9% (52.9%–71.1%)	86.3% (79.6%–93.0%)	54.2% (44.5–63.8%)
>11 g/dl	8 (10.4)	69 (89.6)			

the healthcare workers, consent to obtain blood was refused by nine women. The precision rate of the women with a positive test result or those who were correctly diagnosed with anaemia was 54% (95% CI: 44.5%–63.8%). The sensitivity and the specificity were 62% (95% CI: 52.9%–71.1%) and 86% (95% CI: 79.6%–93.0%) respectively.

Discussion

The quality of detection and treatment of anaemia was assessed in terms of facilities, services, perceived satisfaction and validity of the colour scale. This study revealed that despite high satisfaction rates (see Table 3),

field clinics in the Colombo district provide inadequate facilities and services on screening, diagnosis and treatment of anaemia.

It is now known that with high-quality antenatal care which addresses preventable factors, maternal mortality could be reduced by 50%.¹³ The main factor in reducing mortality and morbidity due to anaemia is to diagnose women with anaemia. A clinical assessment was not performed for nearly three-quarters of women, and in addition to this the haemoglobin colour scale was not available in 60% of clinics. The validity of the colour scale was also poor, which led to a high non-detection rate of anaemia among pregnant women attending field antenatal clinics.

Table 3 Perceived satisfaction on information received from the healthcare workers at the field clinics

	No information received (%)	Not enough information (%)	As much as you wanted (%)	Too much (%)	Don't remember (%)
Information on investigations	4 (1.5)	1 (0.4)	249 (90.5)	17 (6.2)	4 (1.4)
Treatment	6 (2.2)	8 (2.9)	236 (85.8)	18 (6.5)	7 (2.5)

Relationship to previous research

The sensitivity and specificity of the haemoglobin colour scale has been shown to be as high as 95% and 99.6% in other settings¹ and is recommended in settings where resources are limited.¹⁴ However, the haemoglobin colour scale used in the Colombo district showed low sensitivity and specificity due to two main deviations from the correct procedure; i) an inadequate flow of blood from the finger-prick resulting in too small a drop on the test paper and ii) reading the colour scale before the 'drying out' time of 30 seconds had elapsed. As Sri Lanka is a country with low resources, improving the technical competence of healthcare workers in diagnosing anaemia would help to increase the precision and rate of detection.¹⁵

Sri Lanka has evidence of good maternal care indicators. Health policy and strategies to combat maternal mortality and morbidity include iron and folate supplements for all women irrespective of the woman's haemoglobin level. This study revealed that 67% of the clinics provided supplements, whereas the remaining clinics in the Colombo district were short of supplements. Similar results were obtained from other studies in developing countries.¹⁶ Studies have also shown that compliance on supplements among pregnant women is poor,¹⁷ partly because some women are not motivated to take supplements. Improving counselling could motivate these women and improve compliance.¹ However, among the women observed, only 4% of the women were provided with information and counselling in the field antenatal clinics.

Previous studies report that clients equate availability of drugs or investigations with high-quality services,^{18,19} and this was the case in our study, where 90% of pregnant women were satisfied with the adequacy of information received.

Limitations

Costs and social support were not considered as they were beyond the scope of this study. A cost-benefit study of diagnosis and treatment of anaemia would have been advantageous.

Implications for future research and practice

The LQAS was found to be advantageous in assessing the quality of care. Substandard care in some MOH areas should be targeted and urgent steps should be taken to improve the quality of care. However, even with this quality of facilities and services in the field antenatal clinics, Sri Lanka has a low mortality rate compared to other developing countries, albeit a higher rate when compared to developed countries. The need for quality improvement is evident and would help to move the maternal mortality rate in Sri Lanka towards that of developed countries. Further research should be targeted on the costs of detection of anaemia in the field clinics and the scope for hospitals, general practitioners and private sector providers to contribute towards reductions in maternal mortality.

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ETHICAL APPROVAL

Ethical approval for the study was granted by the ethics committee of the University of Sri Jayewardenepura.

PEER REVIEW

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CONFLICTS OF INTEREST

None.

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