Community Medicine Section

Prevalence of Anaemia among Postnatal Mothers in Coastal Karnataka

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ABSTRACT

Introduction: Postpartum is the most neglected period in reproductive cycle of woman. Prevalence of anaemia in developing countries ranges from 50-95%.

Aim: To estimate the prevalence of anaemia among postnatal mothers.

Setting and design: A community based cross-sectional study among recently delivered mothers residing in field practice area of Department of Community Medicine, Kasturba Medical College, Manipal, India.

Materials and Methods: The study sample included 401 respondents who were selected using stratified random sampling with proportionate allocation from all rural health centres. Data was collected by personal interviews followed by haemoglobin estimation by indirect cyanomethaemoglobin method.

Results: The prevalence of postnatal anaemia was 26.5% (Anaemia = Hb<12gm/dl). There were no cases of severe anaemia. Postnatal anaemia was predominantly seen in mothers of age < 20 years and half of the mothers with inter-pregnancy intervals less than two years were found to be anaemic. Illiteracy was identified as a significant variable (OR=11.23, 95% CI = 1.90-65.08) for postpartum anaemia.

Conclusion: The prevalence of anaemia was significantly lower in the present study; however sustained efforts have to be made to further lower the prevalence of postnatal anaemia in order to promote the health and well-being of women.

INTRODUCTION

Anaemia is the world's second leading cause of disability and thus one of the most serious global public health problems [1]. Prevalence of postpartum anaemia in developing countries is in the range of 50-95% [2]. In the entire reproductive lifecycle of a woman, postpartum period is the most neglected period. Even though the problem of iron deficiency in pregnancy is adequately stressed, very little attention has been paid to the same condition during postpartum period which is reflected by the fact that there are only few studies on anaemia during postpartum period as compared to anaemia during pregnancy [3].

A mother may enter the postnatal period having exhausted her iron stores. She may even be a survivor of one of the anaemia-related conditions [4]. The care of woman does not end with the delivery of the child. Postpartum care is one of the essential components of maternal and child health programme but unfortunately, is often neglected. The postpartum care coverage level is 5% to 35% at global level. Timely intervention during the postpartum period can prevent the deaths of both the mother and the neonate and can reduce long term pregnancy related illnesses [5].

Postpartum anaemia is associated with lower quality of life, impaired cognitive ability, lack of emotional stability, depression and other major health problems [6,7]. Anaemia in the postpartum period where mother is learning to parent and take care of new baby will have major consequences. So, post-partum anaemia warrants greater attention and high quality care. It has to be kept in mind that the cut off for defining anaemia in pregnancy and postpartum is different [8]. Studies have shown that haemoglobin concentration gradually increases after delivery and returns to normal by six weeks postpartum [9,10].

In view of the limited literature available, the present study was designed to assess the prevalence of anaemia among postnatal mothers in coastal Karnataka.

MATERIALS AND METHODS

A community based cross-sectional study was done in rural field practice area of Department of Community Medicine, Kasturba Medical College, Manipal University, Manipal over a period of 10 months (October 2011-July 2012). The field practice area is spread over 13 villages covering a population of around 50,000 along coastal part of southern India. Maternity & Child Welfare services to this population is provided through a network of seven Rural Maternity and Child Welfare Homes (RMCW homes) which are under direct administration of the Department of Community Medicine.

The study population included all recently delivered mothers between one and half to five months postpartum as it was easier to contact the postnatal mothers when they brought their children for immunization at 6,10 & 14 weeks. Study variables included socio-demographic characteristics, obstetric characteristics. Mothers having bleeding disorders and not willing to participate in study were excluded from the study.

Considering a prevalence of 54.5% [11] for anaemia in breastfeeding women with an allowable error of 10% and 95% confidence level, the sample size estimated was 334. Considering a non-response rate of 20% sample size was estimated at 401. Stratified random sampling with proportionate allocation from all centers was used for selection of subjects. Ethical committee approval was obtained from institutional ethics committee, before commencement of study (IEC 17/2012)

The details of the families residing in the field practice area are maintained in an electronic database. Data retrieval about postnatal women was done from the database. No sampling procedure was employed. All the women who fulfilled the eligibility criteria and consented were included in the study. Data collection was done at the RMCW Homes for all the mothers who visited the centre for immunization of their children (First, Second and Third dose of DPT, OPV & Hepatitis B). For those mothers who did not visit the

Centre, home visits were done to obtain the necessary information. A trained lab technician accompanied the investigator during data collection. The blood was drawn under aseptic precautions by the technician and transported using a cold box within 2-3 hrs to the central laboratory at the tertiary care hospital, where the investigation was carried out using autoanalyser as per routine protocols & procedures at the hospital.

The investigators developed the questionnaire to gather relevant details about the factors affecting the haemoglobin status of postnatal women. The questionnaire was pilot tested and content and consensual validation was done with subject experts, following which the questionnaire was finalized. The purpose of the study was explained to each mother in detail in the local language and informed consent was obtained.

At the end of the interview, blood was drawn for haemoglobin estimation from the right cubital fossa. A tourniquet was tied above the cubital fossa and two ml of blood was drawn by vene puncture. The sample was collected in Ethylenediaminetetraacetic acid (EDTA) vial (1mg/dl) and was shaken properly to avoid coagulation. All the samples collected for that day was transported to Kasturba Hospital laboratory using proper ice packed containers.

After data collection, the subjects were educated regarding causes of anaemia and its consequences. They were also told about importance of iron rich diet and Iron Folic Acid (IFA) tablets during antenatal as well as postnatal period.

Haemoglobin was estimated by indirect cyanomethaemoglobin method. Sysmex KX–21 automated haematology analyser. Subjects were considered to be anaemic if haemoglobin level was below 12 mg/dl [8]. Results of the investigations were informed to concerned mothers through RMCWH auxiliary nurse midwives. Mothers found anaemic were asked to visit RMCW homes to obtain iron and folic acid tablets.

STATISTICAL ANALYSIS

Data was entered and analysed using Statistical Package for Social Sciences (SPSS version 15). Descriptive statistics are presented in percentages. Chi-square test was used to compare different socio-demographic characteristics, obstetric characteristics, antenatal details and details of delivery with prevalence of anaemia. Risk was estimated in terms of odds ratio (OR) with 95% confidence Interval (95% CI).

RESULTS

Socio-demographic characteristics of study subjects are described in [Table/Fig-1]. The study included 343 respondents with a response rate of 73.8%.

Age Group (Years)	Number	(%)
18-20	20	(5.8)
21-30	253	(73.8)
>30	70	(20.4)
Religion		
Hindus	265	(77.3)
Muslims	70	(20.4)
Christians	08	(2.3)
Literacy status of the subject		
Illiterate	07	(2.0)
Upto High School	208	(60.7)
Pre-University and above	128	(37.3)
Occupation of the subject		
Home Makers	315	(91.8)
White collar and professionals	23	(6.7)
Unskilled	05	(1.4)

[Table/Fig-1]: Baseline Characteristics of study subjects (n=343).

Socio-demographic Characteristics	Study subjects		Risk Estimate	
	Total (n=343) No.	Anaemia Present (n=91) No. (%)	Unadjusted Odds Ratio (OR)	Confidence Interval (95% CI)
Age of the subject (Years)				
21-30	253	66 (26.1)	1.00	
Young mothers (18-20)	20	09 (45.0)	2.31	0.92-5.84
Mothers aged >30	70	16 (22.9)	0.84	0.45-1.56
Religion				
Christians	08	02 (25.0)	1.00	
Muslims	70	19 (27.1)	1.11	0.20-6.02
Hindus	265	70 (26.4)	1.07	0.21-5.46
Literacy				
Graduate & above	60	11 (18.3)	1.00	
Pre-University (11th std -12th std)	68	18 (26.5)	1.60	0.68-3.74
Middle & high-School (5th std -10th std)	206	56 (27.2)	1.66	0.80-3.42
Primary (1st std -4th std)	02	01 (50.0)	4.45	0.25-76.84
Illiterate	07	05 (71.4)	11.13	1.90-65.08
Occupation				
White collar and Professional	23	06 (26.1)	1.00	
Home Makers	315	83 (26.3)	1.01	0.38-2.65
Unskilled	05	02 (40.0)	1.88	0.25-14.13

[Table/Fig-2]: Association of anaemia with socio-demographic characteristics.

Prevalence of anaemia-The prevalence of anaemia among postpartum women was found to be 26.5% (91 subjects) as assessed by indirect cyanomethaemoglobin method (Anaemia = Hb <12 gm/dl) [8]. Mild anaemia (10-12 gm/dl) was found among 89 (25.9%) of the subjects and moderate anaemia (8-10 gm/dl) was present among two (0.6%) of the subjects. No case of severe anaemia (<7gm/dl) was detected.

Anaemia was predominantly seen among in postnatal mothers of aged < 20 years (45%), but no statistical significance was obtained (p=0.135) (OR= 2.31, 95% CI= 0.92-5.84) as reported in [Table/Fig-2]. No marked difference (p=0.962) was observed among different religious groups with respect to prevalence of anaemia. There were only 12 illiterate women, among whom five of them were anaemic. Odds of anaemia among illiterates was higher as compared to graduates (p=0.037) (OR=11.13, 95% CI=1.90-65.08).

Results of association between obstetric details and postnatal anaemia are presented in [Table/Fig-3]. Higher proportion of anaemia was observed in women who had their first conception at an early age (18-20 years) but risk estimate did not show any statistical significance. Half of the women who had inter-pregnancy intervals less than two years were found to be anemic but the association was not statistically significant (p=0.361). There was no significant difference with regard to duration of gestation at delivery, type of delivery and spacing between pregnancies with postnatal anaemia. Postnatal women who had delivered at government hospital and higher prevalence of anaemia as compared with private hospital and the association showed a statistical significance (OR=2.17,95% CI=1.20-3.92)

Early registration of pregnancy, regular antenatal check-ups and institutional deliveries being the norm in the society, there were no significant difference in the prevalence of anaemia based on source of antenatal check-up (p=0.368), antenatal registration (p=0.538) and number of antenatal check-ups (p=0.291). Only four mothers had ≤ 3 antenatal check-up among whom 2 (50%) had anaemia. Irrespective of the duration of gestation at delivery and weight gain during pregnancy, prevalence of anaemia was similar across all categories.

Obstetric Details	Study subjects		Risk Estimate	
	Total (n=343) No.	Anaemia Present (n=91) No. (%)	Unadjusted Odds Ratio (OR)	Confidence Interval (95% CI)
Age at first pregnancy (years)				
21-30	265	70 (26.4)	1.00	
Young mothers (18-20)	49	18 (36.7)	1.61	0.25-3.07
Mothers aged > 30	29	03 (10.3)	0.32	0.09-1.09
Parity				
1	207	52 (25.1)	1.00	
≥2	136	39(28.6)	1.19	0.73-1.95
Inter-pregnancyinterval (years)*				
>3	74	19 (25.7)	1.00	
2-3	54	15 (27.7)	1.09	0.47-2.51
<2	08	04 (50.0)	2.94	0.66-13.00
Duration of gestation at delivery (weeks)				
≥37	316	85(26.9)	1.00	
<37	27	6(22.2)	0.77	0.30-1.98
Place of delivery				
Private	284	67(23.5)	1.00	
Government	59	24 (40.7)	2.17	1.20-3.92
Type of delivery				
Normal Delivery	225	62 (27.6)	1.00	
Caesarean Delivery	118	29 (24.6)	0.85	0.51-1.42

[Table/Fig-3]: Cross tabulation between prevalence of anaemia and obstetric details of study subjects
*Information available for only 136 subjects

DISCUSSION

The magnitude of postnatal anaemia is much more than previously anticipated which has also been reemphasized by NFHS 3 survey [11]. With limited literature available in this area the need for basic prevalence estimates is still the need of the hour. In this regard the present study was the first of its kind to be conducted in the coastal part of Karnataka for postnatal anaemia.

In the current study, prevalence of anaemia was found to be 26.5%, with no case of severe anaemia, in contrast to the findings reported by other studies in India [12-14].

Prevalence of anaemia was much higher in other developing countries like Uganda [4] and Vietnam [15]. Irrespective of location of study, method of assessment and cut-off level for haemoglobin, the presence of anaemia was much lower in the present study as compared to other studies [14-16], which may be attributed to the fact that the study area has better health facilities, higher literacy rates and universal antenatal coverage and institutional deliveries.

Age distribution of the subjects in other reported literature about postpartum anaemia was similar to current study [3,13,14,16,17]. Among studies conducted at Dehradun [15], USA [18], Uganda [4] and Berlin [19] high prevalence of anaemia was demonstrated in younger age group (<20 years) which is also evident in the present study, the only exception being Vietnam where anaemia was present only among 8.6% of younger age group [16].

Illiteracy was identified as a significant variable for postpartum anaemia similar to other studies from United States [18] & Vietnam [16]. Higher prevalence of anaemia seen in illiterates and lower educated group among studies conducted in Dehradun [15], Delhi [3] and Vietnam [16] was also concurrent to our findings.

Anaemia among women engaged in unskilled work was more in comparison to other occupation groups similar to a study conducted in Dehradun [15]. Higher prevalence of anaemia was noted in mothers with parity ≥2 which was similar to the study findings conducted in Mumbai [14] and USA [18].

Over 80% of mothers who had less than three antenatal check-ups

were anaemic in the study done at Bangladesh [17] in contrast to 50% prevalence of anaemia in the present study. Severe anaemia was reported among 8.9% of women who did not receive antenatal care as compared to 7.3% who received antenatal care in a study conducted at Udaipur [13].

Higher prevalence of anaemia was noted in mothers starting prenatal care in third trimester in a study conducted at USA [18]. Anaemia was noted among 25.7% of mothers who had antenatal check-up less than 45 days as compared to 29.1% in mothers who had first antenatal check-up after 45 days in the current study.

There was no difference in the prevalence of anaemia based on period of gestation among postnatal mothers. These findings were in conformity with a study conducted at Berlin [19] where anaemia was reported in 4.5% of subjects with premature delivery (<37 weeks) as compared to 3.1% in term deliveries.

The findings of Bregman et al., regarding weight gain during pregnancy and its association with prevalence of anaemia was in conformity with the current study findings [19].

Mode of delivery did not have any bearing to prevalence of anaemia in the current study similar to results from Bangladesh [17], but Bregman et al., from Germany [19] reported 5% anaemia among women who had undergone caesarean section as compared to 2.2% anaemia among women who had vaginal deliveries.

Blood loss during delivery could be a significant contributor for postnatal anaemia but non-availability of information regarding the same was a limitation of the study. Study results may be generalizable only to similar settings with a well aware population and good health indicators.

LIMITATION

The study cannot be generalized as it was conducted in a region where the health facilities and maternal and child health indicators are better than the other parts of the country.

CONCLUSION

Lower prevalence of anaemia among postnatal mothers in current study is a positive finding; however sustained efforts have to be made to further lower the prevalence of postnatal anaemia in order to promote health and well-being of women. There is a necessity to examine all postnatal women for anaemia at regular intervals and managing them on a priority basis.

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