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Research Article

Utilization of antenatal care services and correlates of anaemia among pregnant women attending a tertiary care hospital in Assam, India

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ABSTRACT

Background: Anaemia is one of the most commonly encountered medical disorders during pregnancy. As per NFHS-3 Assam 72% pregnant women are anaemic. Besides many adverse effects on mother and foetus, anaemia contributes significantly high maternal mortality. Early Antenatal booking and regular follow-up provides opportunities for delivering timely and essential interventions to the pregnant women. This study aims to explore the socio-demographic factors influencing the pattern of antenatal care services utilization and also to estimate the burden of anaemia in Assam.
Methods: A cross-sectional hospital based study was carried out for three months, from November 2011 to February 2012 in Jorhat Medical College Hospital using a predesigned, pretested proforma. A total of 1845 women admitted in the postnatal ward were studied.
Results: Only 9.51% were illiterate, 64.89% were primigravidae, 70.09% had no previous living issues. All were registered for ANC, of whom 57.62% were registered in the first trimester; 57.98% had adequate ANC; 65.97% received full course of IFA tablets. Adequate ANCs were availed in the younger age groups, the primigravidae and up to two living children. A total of 61.69% pregnant women were found to be anaemic; 46.80% mildly, 12.85% moderately and 2.03% severely anaemic. Most participants in 20-25 years age group (63.7%) and lower socio-economic class (62.63%) were found to be anaemic. Participants who registered for ANC after 12th week (83.4%), attended inadequate number of ANCs (70.06%), and failed to take IFA tablets (60%) were found anaemic.
Conclusions: A total of 61.69% pregnant women were found to be anaemic. Early detection and effective management of anaemia in pregnancy can contribute substantially to reduction in maternal mortality.

Keywords: Anaemia, Pattern of utilization of antenatal services, Socio demographic characteristics

INTRODUCTION

Maternal health is important to communities, families and the nation due to its profound effects on the health of women, immediate survival of the new born and long term well-being of children, particularly girls and the well-being of families. Maternal health has ever been a serious matter of concern worldwide. In developing countries like India, maternal health care services are not sufficient as per requirement, which ultimately leads to maternal deaths triggering a challenge to achieve improve maternal health. Maternal death and illness have cost implications for family and the community because of high direct and indirect costs, the adverse impact on

productivity and the tremendous human tragedy that every maternal or child death represents.[1]

Antenatal care is essential to reduce morbidity and mortality among new born babies and pregnant women.[2] Early Antenatal check-up (ANC) booking and regular follow-up of services usually provides opportunities for delivering services that can significantly enhance the health of the mother and fetus.[3,4] On the contrary, opportunities to provide information and other interventions pertaining to their reproductive health and the health of their unborn child are missed when a woman initiates ANC in late time of her pregnancy.[5,6] World Health Organization (WHO) in 2002 recommends that pregnant women should attend ANC at least 4 times starting from the first trimester.[7] National Family Health Survey-3 (NFHS-3) reveals that more than three quarters of pregnant women in India receive at least some antenatal care (ANC), but only half of the pregnant women make at least 3 visits to health practitioners during their pregnancy.[8,9] There is vast disparity in the indicators between the high performing states like Kerala, and the low performing states like the EAG states and Assam. Assam remains at the bottom with regard to Maternal Mortality Ratio, which is considered one of the most important indicators of maternal health.

Anaemia is one of the most commonly encountered medical disorders during pregnancy. Anaemia in pregnancy is one of the major causes of maternal morbidity, mortality and reproductive wastage in the world including India. However, regional and community variations for anaemia exist throughout India.[10] The main cause of anaemia in pregnancy may be due to hemodilution, poor intake of nutrition, increased need of body supplement due to growing fetus, poor absorption, parasitic infestation, and faulty food habit like tea consumption before food intake, less vitamin-c intake, poor sanitation, social taboo and psychological.[11] Moreover, they were also exposed to diseases due to the insanitary conditions of the environment. Thus, cultural factors play an important role in determining haemoglobin status at micro-level, even in high-income households As per NFHS-3 (2005-6) survey Assam 72% pregnant women are anaemic.[12] It is a cause of serious concern as, besides many other adverse effects on the mother and the fetus, it contributes significantly high maternal mortality.[13]

Anaemia in pregnancy is a public health issue taking heavy tolls in the form of abortion, premature birth, intrauterine growth retardation, high infant mortality and 20 to 40 percent maternal death of India.[14] Maternal anaemia is associated with poor intrauterine growth and increased risk of preterm births and low birth weight rates which in turn, lead to poor growth trajectory in infancy, childhood and adolescence and contribute to low adult height. Physical and cognitive development in growing phases of life is hampered among children of anaemic mothers. Thus maternal anaemia contributes to intergenerational cycle of poor growth in the offspring. At a macro level it distorts human resource development and economic prosperity of country.[15] Nutritional supplementations is suggested to overcome the low level of hemoglobin and to get better pregnancy outcome in the vulnerable communities of pregnant women.[10]

The high prevalence of anaemia, despite the availability and easy access to medical care, indicates the level of ignorance and indifference to health needs. Hardships imposed by gender, poor nutrition, extremes of age, primparity or grand multiparity and short pregnancy intervals have significant influence on haemoglobin concentration.[16] The pregnant women who registers early before 12 weeks for ante-natal care and takes iron regularly has greater iron reserves, higher haemoglobin levels and a lower prevalence of anaemia.[17,18] The socio-demographic factors associated with antenatal care utilization of antenatal care services - age, religion, maternal education, husband's education, marital status, employment status and parity. Other factors that influence Maternal Health care service utilization include cost, availability of service, household income and access to health information exposure, previous history of obstetric complications, cultural beliefs and ideas about pregnancy.[2,7,9,19,20] There is an urgent need to make pregnant women and their families aware about the importance of antenatal care. Early detection and effective management of anaemia in pregnancy can contribute substantially to reduction in maternal mortality.

This study, therefore, aims to study the pattern of Maternal Health services utilization, the socio-demographic factors influencing it and the prevalence of anaemia.

METHODS

A cross-sectional study was carried out for three months during the period of November, 2011 to February, 2012 in the postnatal ward of Jorhat Medical College Hospital, Jorhat, Assam. Patients come from all classes of society but predominantly from the middle and lower classes. A total of about 7500 deliveries take place per year in the hospital. A total of 1845 antenatal mothers admitted in Jorhat Medical College Hospital between November 2011 and February 2012 were studied.

A pre-designed and pre-tested proforma was used to get information regarding socio-demographic factors and the antenatal care they had received during pregnancy. The classification of the patients for anaemia was done on the basis of the haemoglobin level at their last ANC. Informed consent of the participants was taken. All the questions were asked in the participant's language or else the meaning was conveyed properly. Data were entered in MS Excel and analyzed using Standard Statistical Techniques.

RESULTS

Out of a total of 1845 women recruited for the survey, majority of the women(54.78%) were in the age group of 20-25 years. 9.51% of the women were illiterate; rest 90.49% were literate and 24.94% had passed class 10 also majority 1197 (64.89%) were primigravidas, 634 (34.38%) were multigravidas and 13 (0.73%) were grand-multigravidas; 1293 women (70.09%) who were admitted in the postnatal wards had no previous living issues, and 464 (25.15%) had one living child (Table 1).

Considering more than three Antenatal Checkups as adequate, the proportion of women obtaining adequate antenatal care was more in the younger age groups up to 30 years of age. About two-third of women < 30 years age had adequate ANC visits, whereas about only one-third of the women above 30 years age had the adequate opportunity. Educational status did not affect the utilization of ANCs as utilization was found to be fairly good across all literacy groups. Utilization of ANC services was found better (59.45%) among the primigravidae as compared to the multigravidae (50.43%). However, all grand multigravidae having more than four pregnancies had attended adequate number of ANCs. With regard to living issues, more women with up to two living children had adequate number of ANCs. While all women with three or more living children, had inadequate ANCs (Table 1).

Table 1: Socio demographic characteristics and ANC utilization.

Sociodemographic characteristics	Total Participants		Adequate ANC Utilization (>3 ANCs)		p-value
	N=1845	Percentage	Number	Percentage	
Age					<0.001
<20	185	10.02	114	61.11	
20-25	1010	54.78	603	60.10	
25-30	486	26.34	302	59.18	
30-35	90	4.90	31	37.50	
35-40	65	3.50	26	41.67	
>40	9	0.47	0	0.00	
Education					<0.001
Illiterate	175	9.51	96	60.00	
Literate	1209	65.55	654	51.69	
Class 10 pass	460	24.94	263	62.82	
Gravida					<0.001
Primi(1)	1197	64.89	706	59.45	
Multi(2 to 4)	634	34.38	323	50.43	
Grand multi(>4)	13	0.73	16	100.00	
Living issues					<0.005
0	1293	70.09	790	60.46	
1	464	25.15	235	51.70	
2	59	3.17	34	55.02	
3	19	1.04	0	0.00	
4	10	0.55	0	0.00	

Amongst the 1845 participants, a total of 61.69% pregnant women were found to be anaemic; 46.80% participants mildly anaemic, 12.85% moderately anaemic and 2.03% severely anaemic. Only 38.31% were found to have normal haemoglobin level above 11gm%.

All (100%) the participants were registered during antenatal period and out of these, 1063 (57.62%) were registered in the first trimester followed by 771 (41.79%) in the second trimester. About 1070 (57.98%) had more than three ANC visits during the pregnancy while 775 (42.02%) had 1-3 visits. About 1217 (65.97%) women received the full course of atleast 100 iron and folic acid (IFA) tablets while 623 (33.75%) women did not received the full course, and another 58 (0.28%) didnot receive IFA tablets at all.

Table 2: Haemoglobin levels of the Participants.

Hb%	Total	Percentage
< 7 gm%	37	2.03
7 to 9 gm%	237	12.85
9 to 11 gm%	863	46.80
> 11 gm%	707	38.31
Total	1845	100.00

Anaemia was most prevalent among younger age group of pregnant women with 63.7% in 20-25 years age group being anaemic. Anaemia was found to be present distributed equally across all educational groups, in both types of families and irrespective of parity, and in 62.63% of participants belonging to lower socio-economic class. Anaemia was alarmingly present (83.40%) in those who registered after the 12th week of pregnancy, and also in those who attended inadequate number of ANCs (70.06%) as compared to those attending 4 or more ANCs (55.61%). In the present study, most pregnant women were found not to have taken extra food (72.52%) during pregnancy. Anaemia was found to be more prevalent (68.61%) in this group. Presence of anaemia showed an inverse trend against intake of IFA tablets.

While among those who took the full course, anaemia was present in 15.44%, it was seen that anaemia was present in 60.0% of those who did not take IFA tablets at all.

Table 3: Distribution of anaemia according to socio-demographic factors and ANC utilization.

	Total		Anaemic (<11 gm%)		p- value
	Number	Percentage	Number	Percentage	
Age					
<20 years	185	10.02	112	61.88	<0.001
20-25 years	1010	54.78	658	63.70	
25-30 years	486	26.34	283	60.21	
30-35 years	90	4.90	47	54.02	
35-40 years	65	3.50	21	36.21	
>40years	9	0.47	18	100.00	
Education					
Non-literate	175	9.51	83	47.43	
Below 10th	1209	65.55	749	61.95	
Beyond 10th Std pass	460	24.94	86	18.70	
Socio-economic status					
I Upper	0	0.00	0	0	
II Upper Middle	0	0.00	0	0	
III Middle/Lower middle	227	12.30	102	44.93	
IV Lower/Upper lower	827	44.82	375	45.34	
V Lower	792	42.93	496	62.63	
Type of Family					
Nuclear	649	35.18	347	53.47	
Joint	1196	64.82	617	51.59	
Extra food during Pregnancy					
Yes	507	27.48	290	57.20	
No	1338	72.52	918	68.61	
Gravida					
Primi (1)	1197	64.89	735	61.40	(not significant)
Multi (2 to 4)	634	34.38	390	61.51	
Grand multi (>4)	13	0.73	13	100.00	
Time of Regn.					
<=12 weeks	1063	57.62	629	59.17	
12 to 28 weeks	771	41.79	643	83.40	
> 28 weeks	11	0.6	9	81.82	
No of ANCs					
1 to 3 ANCs	775	42.01	543	70.06	<0.001
>3 ANCs	1070	57.99	595	55.61	
IFA Supplementation					
Taken 100 or more tablets	1217	65.97	188	15.44	
Partial	623	33.77	131	21.03	
Nil	5	0.27	3	60.00	

Table 4: Severity of anaemia according to socio-demographic factors and ANC utilization.

	Mild Anaemic (9-11gm%)	Moderate Anaemic (7-9gm%)	Severe Anaemic (<7gm%)	Total	p-value
Age					
<20 years	80	18	14	112	<0.001
20-25 years	504	144	10	658	
25-30 years	206	64	13	283	
30-35 years	38	9	0	47	
35-40 years	21	0	0	21	
>40years	15	3	0	18	
Gravida					
Primi (1)	556	158	25	739	(not significant)
Multi (2 to 4)	298	79	12	389	
Grand-multi(>4)	10	0	0	10	
No of ANCs					
1 to 3 ANCs	386	125	32	543	(not significant)
>3 ANCs	478	112	5	595	
Total	864	237	37	1138	

Severity of anaemia was found to be significantly associated with the age of the mother. Younger mothers were found to be more predisposed to become anaemic. However, the gravid and number of ANCs were not found to be significantly associated with presence of anaemia in the pregnant mothers.

DISCUSSION

The present study was conducted as a cross-sectional hospital based study in the postnatal ward of Jorhat Medical College Hospital, Jorhat, Assam during the period of November, 2011 to February, 2012 to study the pattern of Maternal Health services utilization, the socio-demographic factors influencing it and the prevalence of anaemia.

Amongst the participants, majority of the women (54.78%) were in the age group of 20-25 years. This is comparable to the findings of Gupta et.al (58.82%) and Khatib et.al (mean age 23.37 years).[7,19] Only 9.51% of the women were illiterate. This is in vast contrast to the findings of Gupta et.al, Khatib et.al, and Shindhaye et.al., who had recorded illiteracy among their study population as 37.3%, 38.3% and 27.4% respectively.[7,8,21] However This finding is in concordance with the Coverage Evaluation Survey Report of 2012-13 from Assam.[22] Majority (64.89%) were primigravidas, 34.38% were multigravidas and 0.73% were grand-multigravidas with more than four children. Khatib et.al who also found 56.9% antenatal mothers to be primigravidae; but according to Gupta et.al., 55.9% had 2-3 children.[7,19] Also, 70.09% had no previous living issues, and 25.15% had one living child. Indian women seem to marry early and begin their reproductive phase early in life. Now, with most families adopting small family norms, the beneficiaries who come for health services are usually in their early reproductive scores, and seeking utmost care especially for the first pregnancy. Government initiatives have largely been responsible for being able to bring expectant mothers for utilization of health care.

In the present study population, all the women were registered during antenatal period and of whom 57.62% were registered in the first trimester and 41.79% in the second trimester. This is in contrast to the findings of the study by Shindhaye et.al. which reported 20.5% of the women to not being registered for antenatal checkups; and only 27.6% were registered in the first trimester while 43.1% were registered in the second trimester.[21] 57.98% had more than three ANC visits during the pregnancy while 42.02% had 1-3 visits. The study by Shindhaye et.al had reported that only 10.5% women had more than three ANC visits during the pregnancy.[21] Among our study population, 65.97% women received the full course of at least 100 Iron Folic Acid (IFA) tablets while 33.75% women did not received the full course, and another 0.28% did not receive IFA tablets at all. This is comparable to the findings of Shindhaye et al., according to which, 86.2% had received IFA tablets. However, according to Khatib et.al, only 35.7% women received the full course of at least 100 iron and folic acid (IFA) tablets while 64.3% women did not received the full course, and another 12.1% didnot receive IFA tablets at all.[9,21] Health care services, including antenatal care services have improved over the past decade. The Accredited Social Health Activists (ASHAs) have played a vital role in the utilization of maternal health care services, and thus in improving the maternal health indicators.

According to the present study, the proportion of women obtaining adequate antenatal care was more in the

younger age groups up to 30 years of age. About two-third of women less than 30 years age had adequate ANC visits, whereas about only one-third of the women above 30 years age had the adequate opportunity. According to the study by Gupta et.al.[19] ANC utilization was good throughout all age groups; however, Singh et.al.[20] reported inadequate ANC utilization in the age groups above 35 years. Educational status did not affect the utilization of ANCs as utilization was found to be fairly good across all literacy groups. According to the study by Gupta et.al.[19] ANC utilization was proportional to the education of the women. According to the study by Verma et.al.[8] 62% of illiterates showed inadequate ANC utilization, while the primary educated group showed better percentage of ANC utilization. The study by Singh et.al.[20] reported 89.2% of the women educated above school level to be adequately utilizing Antenatal services. Utilization of ANC services was found better (59.45%) among the primigravidae as compared to the multigravidae (50.43%). This is comparable to the findings of Verma et. al.[8] and Singh et. al.[20] which reported better ANC utilization amongst the primigravidae. With regard to living issues, more women with up to two living children had adequate number of ANCs. While all women with three or more living children had inadequate ANCs. Indian women marry early and begin their reproductive phase early in life. Now, with most families adopting small family norms, the beneficiaries who come for health services, are usually young and in their early reproductive scores, and seeking utmost care especially for the first pregnancy. Government initiatives have largely been responsible for being able to bring expectant mothers for utilization of health care.

A total of 61.69% pregnant women were found to be anaemic, which is comparable to the findings of Bisoi, et.al. (67.8%) and Noronha, et. al (50.14 %). Wadgave, et.al had reported 92.38%. Srivastava et al had reported 87.4% of their study subjects to be anaemic, whereas, Bivalkar , et.al had reported as less as 43.4% to be anaemic.[13,23-26] The prevalence of anaemia as found in the present study stands slightly lower than the national average of 72% as given by NFHS 3 which was conducted in 2005. With the thrust of interventions under NHM and the newer initiatives under RCH-II since 2005, such an improvement of parameter is explainable and expected. The scenario of antenatal care and IFA supplementation has indeed improved the health status of this reproductive group in recent times.

In the present study, 46.80% participants were found to be mildly anaemic, 12.85% moderately anaemic and 2.03% severely anaemic. This is comparable to the findings of the studies by Bisoi et.al, and Sahoo , et.al, which showed majority of those anaemic to be mildly anaemic and less than 5% to be severely anaemic. According to the study by Wadgave, 39.66% were mild anemic, 49.09% moderate anemic and 3.63% were severe anemic.[11,13,25] According to Bisoi et.al, 50.9 percent, 12.4 percent and 4.5 percent were found to have mild, moderate and severe grades, respectively. According to Bivalkar, et.al., 16.7 % were mildly anaemic, 26% moderately anaemic and 0.7% severely anemic.[11,13,26] According to Sahoo, et.al, 54.54% participants were mild anemic, 43.92% moderate and 3.54% severe anemic. Mild anaemia may not have any effect on pregnancy and labour except that the mother will have low iron stores and may become moderately-to-severely anemic in subsequent pregnancies. Moderate anaemia may cause increased weakness. Severe anaemia, however, is associated with poor outcome. The woman may have palpitations, breathlessness, and also cardiac failure which may be fatal.[5,8] Increased incidence of pre-term labour (28.2%), pre-eclampsia (31.2%) and sepsis have been associated with anaemia. Adverse perinatal outcome in the form of pre-term and small-for-gestational-age babies and increased perinatal mortality rates occur in neonates of anemic mothers.[27]

According to the present study, the prevalence of anaemia was high among younger age group of pregnant women with maximum prevalence (63.7%) in the 20-25 years age group. This is in concordance to the findings of Noronha et.al. (57.72%), Bisoi , et.al, and Bivalkar, et.al, all of whom reported anaemia to be occurring mostly in younger mothers.[13,23,26] The greater prevalence of anemia in the younger age group may be explained by the fact that poor iron stores at birth, low dietary iron intake through childhood results in high frequency of anaemia in childhood. With the onset of menstruation and associated blood loss, there is the further rise in prevalence and severity of anaemia in adolescent girls. Anaemia gets aggravated by increased requirements during adolescence and during pregnancy.[11]

According to the present study, most of the women were found to be literate below class 10 level (65.55%) but anaemia was found to be present across all educational status. According to Bisoi, et.al, an inverse relation was found between education and anaemia which showed significant increase with decrease in literacy status. According to Bivalkar, et.al, most of the women are educated up to primary level having (57.5%) anaemia but as per non anemic cases 51.8% are also educated up to primary level.[13,26] Irrespective of the educational status, maternal awareness about diet, regular ANC visits and personal care has been found to be good in the present study population, probably due to more exposure to mass media and better communication from the health workers.

According to the present study most of the participants belonged to upper-lower and lower socio-economic groups (44.82% and 42.93% respectively). Anaemia was however, found in the majority (62.63%) of participants from lower socio-economic class. This is comparable to the findings of Bisoi, et.al and Bivalkar, et.al, which also had reported more of anaemia in the lower to middle socio-economic class. Lower socio-economic group means lower purchasing power and poorer diet in the

family. This results in more of anaemia in this group in the Indian society.

According to the present study, most (64.82%) participants belonged to joint families. However anaemia was found to be evenly distributed in both types of families. This finding is in vast contrast to the findings of Bisoi, et.al and Bivalkar et.al (78.5%), both of which studies had reported significantly higher proportion of anaemia amongst women from joint families. the finding in the present study can be explained by the fact that, the joint family system existent in Assam is not as hierarchal dominating as in many other parts of India. However, unequal distribution of food in the family and eating last, with less food is a tradition and a determinant of nutritional status of Indian women.

According to the present study most pregnant women had not taken extra food (72.52%) during pregnancy, and anaemia was also found to be more prevalent (68.61%) in this group. The study by Bisoi et al had also reported that no pregnant women had taken extra meal during pregnancy however, in their study, prevalence of anaemia was not different in comparison to those did consume extra food.

According to the present study, most (64.89%) participants were primigravidae, however, anaemia was found to be equally distributed irrespective of the parity of the pregnant women which is comparable to the findings of Bisoi et.al. Bivalkar et al and Sahoo et al had reported more anemia in multigravidae with more than 1-2 children. This finding can only be explained in the light that the blood loss during successive deliveries in the multigravidae is balanced by the nutritional drain of even the first pregnancy on the growing adolescent or young mother.

In the present study, it was found that most (57.62%) participants registered themselves for ANC early in pregnancy and also, anaemia was alarmingly present (83.40%) in those who registered after the 12th week of pregnancy. Bisoi, et al had also reported that early registration appeared to be a protective factor against anaemia.[13] The benefit of antenatal care is undeniable. Early Antenatal check-up (ANC) booking and regular follow-up of services usually provides opportunities for delivering services that can significantly enhance the health of the mother and fetus.[3,4]

It was found in the present study that 58.37% participants took the full course of IFA supplementation tablets and another 7.53% took even more than the prescribed 100 tablets. Presence of anaemia showed an inverse trend against intake of IFA tablets. While among those who took the full course, anaemia was present in 16.53%, it was seen that anaemia was present in 60.0% of those who did not take IFA tablets at all. According to the study by Bisoi, et.al, anaemia was significantly lower compared to non-user of IFA tablets. This proves that IFA tablets play an indispensible role in the prevention of anaemia. Inadequate dietary iron, folate intake due to low vegetable consumption, perhaps low B12 intake and poor bioavailability of dietary iron from the fibre, phytate rich Indian diets are the major factors responsible for high prevalence of anaemia. A woman is therefore invariably predisposed to anaemia. The intake of IFA tablets from early pregnancy can help reduce the losses during the pregnancy.

CONCLUSION

Anaemia is a silent destroyer. Maternal anaemia is associated with poor intrauterine growth and increased risk of preterm births and low birth weight rates which in turn, lead to poor growth trajectory in infancy, childhood and adolescence and contribute to low adult height. Thus maternal anaemia contributes to intergenerational cycle of poor growth in the offspring. The high prevalence of anaemia, despite the availability and easy access to medical care, indicates the level of ignorance and indifference to health needs. It was found that antenatal care services, in spite of being essential to the care of pregnant women, is utilized adequately by less than 60% of antenatal mothers. Most women were found to be aware of the Antenatal care services but the lack of benefit perceived by them in the context of all the practicalities and expenditure involved in availing the services was the predominant factor hampering the utilization. Antenatal care is the single most important intervention that can reduce the maternal and infant morbidity and mortality in developing countries and so antenatal care services need to be delivered more practically. There is an urgent need to make pregnant women and their families aware about the importance of antenatal care. Early detection and effective management of anaemia in pregnancy can contribute substantially to reduction in maternal mortality. Nutritional supplementations were suggested to overcome the low level of hemoglobin and to get better pregnancy outcome in the vulnerable communities of pregnant women

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