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PREVALENCE AND DEGREE OF ANEMIA AMONG ANTENATAL MOTHERS ATTENDING PRIVATE HOSPITALS IN VISAKHAPATNAM DISTRICT

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ABSTRACT

Introduction: Anemia affects almost two‑thirds of pregnant women in developing countries and contributes to maternal mortality and low birthweight. Nutritional anemia as iron deficiency anemia (IDA) is the most common cause of anemia during pregnancy, globally affecting about 32 million women and at least half of all the pregnant women in middle and low‑income countries. **Objectives:** To study the prevalence and degree of anemia among antenatal mothers attending private hospitals in Visakhapatnam district. **Materials and Methods:** A total of 400 primi and multigravida women who were attended antenatal clinic were included in the study after getting written informed consent. The haemoglobin was measured using automated cell counter method and those with haemoglobin level <10 g/dl were considered as anaemic. **Results:** The result of the study shows that prevalence of anemia was common among antenatal mothers (79.5%). It has been found that mild, moderate, and severe anemia account for 31.2%, 38.3%, and 10%, respectively. There was significant association between demographic variables such as religion (p=0.020) and occupation (p=0.001), premarital and obstetrical history age at menarche (p=0.001), menstrual flow (p=0.000), menstrual duration (p=0.038) with anemia. **Conclusion:** The present study concludes most of the antenatal women attending antenatal clinic were anaemic which is a serious public health problem. To prevent this anemia control program should be executed more resourcefully in this vital segment of population. Efforts should be aimed toward the early diagnosis and treatment of anemia well before the time of full term delivery.

KEYWORDS: Anemia, Prevalence, Primi gravida women, Multigravida women, Private hospitals.

INTRODUCTION

Anemia is a severe public health problem affecting both developed and developing countries with major consequences for human health as well as socioeconomic development. It occurs at all stages of life but is more prevalent in pregnant women and young children.

It is estimated worldwide that 41.8% of pregnant and 30.2% of non-pregnant women are anemic.[1] The WHO has estimated that the prevalence of anemia in pregnant women is 14% in developed and 51% in developing countries. It is painful to mention that India contributes to about 80% of the maternal deaths due to anemia in South Asia.[2]

Anemia is considered as a major cause of maternal and fetal morbidity and mortality in developing countries.[3] It may lead to premature birth, low birth weight, fetal cognitive impairment, and fetal death.[4] Maternal complication includes preeclampsia, antepartum hemorrhage, puerperal sepsis, and thromboembolic complications leading to subinvolution of the uterus, failure of lactation, and delayed wound healing.

Iron deficiency anemia is the most common nutritional disorder in the world affecting 2 billion people worldwide.[5] Total iron demand in pregnancy is about 900 mg (with a range of 700–1400 mg), of which about 500–600 mg is accounted by the uterus and its contents. Around 150–200 mg is lost in the blood loss at delivery and a similar amount is expended in lactation. Pregnant mothers do not give priority to health because most of them are engaged in different works keeping them busy throughout the day. Therefore, identification of the risk factors contributing to anemia in pregnant mothers is vital for its prevention and control.

Anaemia during gestation and in delivering women is a global problem for mothers and babies resulting in deaths of approximately 115,000 mothers and 590,000 perinatal babies annually. [6,7] Anaemia in gestation and delivery influence the risk of hemorrhage, labor complications, aberrant delivery [8] and also escalate the risk of infection to both mother and developing embryo as result of perturbed immunity and disparity in hormonal orchestration.[9–12] The gestational complications, maternal mortality, low birth weight and adverse birth outcome are among the prominent consequences of anaemia in pregnancy in most developing countries, particularly in south-east Asia.[13,14] Despite the advancing knowledge in obstetric technology, achievements in maternal and child health (MCH) related issues, MCH and nutritional awareness programs over the past decade.[15–17] anaemia remains enigmatic for pregnancy and delivering women in low- and middle income countries including India.[18]

An estimated 15 million babies are born preterm and 20 million LBW infants born every year and its prevalence is global public health problem, particularly in developing countries, this number is still rising despite of extensive integrated efforts and improved maternal and child health care interventions across the globe.[19,20] Anaemia is long being considered as an indicator of both poor nutrition and impaired health for women in general and particularly more adversely affecting the reproducing women and increases the risk of maternal and neonatal adverse outcomes.

The adversity and impact of maternal anaemia is vulnerability to preterm birth and low birth weight babies in addition to various other gestational complications, such as the risk of miscarriages, stillbirths, intra-uterine growth retardation and risk of postpartum hemorrhage. [21] These adversities are the consequences of altered physiological equilibrium and accumulative gynaecological and obstetric factors.

India became the first developing country to take up the National Nutritional Anaemia Control Programme to prevent anemia among pregnant women. The Government of India recommends 100 mg of elemental iron+500 ug of folic acid for prophylactic supplementation for minimum of 100 days starting in the second trimester and double this dose for the treatment of anemia, that is, 200 mg of elemental iron+1000 ug of folic acid. [22] Despite these efforts, the prevalence of anemia is 65–75% in India.

Thus, this study was taken up to establish evidence-based information on the prevalence of anemia in pregnant women who are attending privates hospitals in Visakhapatnam district.

MATERIALS AND METHODS

A cross sectional study conducted at private hospitals of Visakhapatnam district between January to August 2022. A total of 400 primi and multigravida women who were attended antenatal clinic were included in the study after getting written informed consent. The hemoglobin was measured using automated cell counter method and those with hemoglobin level <10 g/dl were considered as anaemic and were investigated further to be assessed according to the World Health Organisation classification. Data were collected using social demographic profile of the mothers, that is, age, religion, education status, occupation, type of family, family income, residence, dietary pattern and premarital and obstetric history includes age at menarche, menstrual cycle, menstrual flow, menstrual duration, age at pregnancy, gestational age, Questionnaire was both in English and local language. All the questionnaires were checked for completeness and consistency in daily basis.

RESULTS

Table 1: Sample Characteristics. n=400.

Demographic Variables	f	%
1. **Age in years**		
a) 20- 23 yrs	64	16.0
b) 24 – 27 yrs	196	49.0
c) 28 – 31 yrs	104	26.0
d) Above 31 yrs	36	9.0
2**. Religion**		
a) Hindu	212	53.0
b) Christian	164	41.0
c) Muslim	24	6.0
3. **Educational Status**		
a) Illiterate	60	15.0
b) Primary school	240	60.0
c) High school	52	13.0
d) Hr. Secondary.	48	12.0
4. **Occupation**		
a) House wife	172	43.0
b) Daily wages	164	41.0
c) Private employee	52	13.0
d) Professional	12	3.0
5. **Type of family**		
a) Nuclear	128	32.0
b) Joint	272	68.0
6. **Family Income**		
a) Below Rs. 10,000	24	6.0
b) Rs. 10,001 – 15,000	24	6.0
c) Rs. 15,001 – 20,000	80	20.0
d) Above Rs. 20,000	272	68.0
7. **Place of Residence**		
a) Rural	152	38.0
b) Urban	248	62.0
8. **Diet Habits**		
a) Vegetarian	72	18.0
b) Non vegetarian	328	82.0

Table 2: Premarital & Obstetrical History n=400.

Premarital & Obstetrical History	f	%
1. **Age at Menarche**		
a. ≥12 years	112	28.0
b. 13-14 years	280	70.0
c) 15-16 years	8	2.0
2. **Menstrual Cycle**		
a) Regular	320	80.0
b) Irregular	80	20.0
3. **Menstrual Flow**		
a) Normal	160	40.0
b) Moderate	220	55.0
c) Heavy	20	5.0
4. **Menstrual Duration**		
a) 3 days	176	44.0
b) 4 days	208	52.0
c) 5 days	16	4.0
5. **Age at first pregnancy**		
a. 18 – 21 years	128	32.0
b. 22 – 26 years	272	68.0
c) 27 – 30 years	0	0.0
6. **Gestational Age**		
a. < 12 weeks	132	33.0
b. 13 – 28 weeks	204	51.0
c) 29 – 40 weeks	64	16.0

Table 3: Prevalence of Anemia among antenatal mothers n=400.

Level of Anemia	f	%
Mild (8-10 gm/dl)	125	31.2
Moderate (7.0- 7.99 gm/dl)	153	38.3
Severe (Less than 7.0 gm/dl)	40	10.0
No Anemia (More than 10 gm/dl)	82	20.5

Table 3 shows level of anemia among antenatal mothers. Majority 318 (79.5) antenatal mothers had mild to severe levels of anaemia and 82 (20.5%) antenatal mothers had no anemia. It shows that prevalence of anemia is common among antenatal mothers.

Table 4: Association of demographic variables with anemia.

Demographic Variables	Total	Presence of Anemia (318)	Absence of Anemia (82)	Chi square Test
1. **Age in years**				
a) 20- 23 yrs	64	49	15	$\chi 2 = 1.075$ D.f. = 3 p=0.78
b) 24 – 27 yrs	196	155	41	
c) 28 – 31 yrs	104	86	18	
d) Above 31 yrs	36	28	8	
2**. Religion**				
a) Hindu	212	168	44	$\chi 2 = 7.787$ D.f. = 2 p=0.020*
b) Christian	164	136	28	
c) Muslim	24	14	10	
3. **Educational Status**				
a) Illiterate	60	44	16	$\chi 2 = 3.692$ D.f. = 3 p=0.296
b) Primary school	240	189	51	
c) High school	52	43	9	
d) Hr. Secondary.	48	42	6	
4. **Occupation**				$\chi 2 = 15.31$ D.f. = 3
a) House wife	172	140	32	

b) Daily wages	164	138	26	p=0.001**
c) Private employee	52	34	18	
d) Professional	12	6	6	
5. **Type of family**				χ 2 = 0.353
a) Nuclear	128	104	24	D.f. = 1
b) Joint	272	214	58	p=0.552
6. **Family Income**				
a) Below Rs. 10,000	24	17	7	χ 2 = 5.883
b) Rs. 10,001 – 15,000	24	16	8	D.f. = 3
c) Rs. 15,001 – 20,000	80	69	11	p=0.117
d) Above Rs. 20,000	272	218	54	
7. **Place of Residence**				χ 2 = 1.126
a) Rural	152	125	27	D.f. = 1
b) Urban	248	193	55	p=0.288
8. **Diet Habits**				χ 2 = 0.060
a) Vegetarian	72	58	14	D.f. = 1
b) Non vegetarian	328	260	68	p=0.806

n=400

The data presented in Table 4 portrays association between demographic variables with anemia. Pearson Chi-square test was used to calculate the association. There was significant association between anemia and demographic variables such as age at religion (χ^2 =7.787, p=0.020), occupation (χ^2 = 15.31, p=0.001).

Table 5: Association of premarital and obstetrical history with anemia n=400.

Premarital & Obstetrical History	Total	Presence of Anemia (318)	Absence of Anemia (82)	Chi Square Test
1. **Age at Menarche**				χ 2 = 13.74
a. ≥12 years	112	82	30	D.f. = 2
b. 13-14 years	280	233	47	p=0.001**
c) 15-16 years	8	3	5	
2. **Menstrual Cycle**				χ 2 = 2.795
a) Regular	320	249	71	D.f. = 1
b) Irregular	80	69	11	p=0.094
3. **Menstrual Flow**				
a) Normal	160	137	23	χ 2 = 22.93
b) Moderate	220	173	47	D.f. = 2
c) Heavy	20	8	12	p=0.000***
4. **Menstrual Duration**				χ 2 = 6.532
a) 3 days	176	148	28	D.f. = 2
b) 4 days	208	158	50	p=0.038*
c) 5 days	16	10	6	
5. **Age at first pregnancy**				χ 2 = 2.744
a. 18 – 21 years	128	108	20	D.f. = 1
b. 22 – 26 years	272	210	62	p=0.097
6. **Gestational Age**				χ 2 = 0.411
a. < 12 weeks	132	106	26	D.f. = 2
b. 13 – 28 weeks	204	163	41	p=0.814
c) 29 – 40 weeks	64	49	15	

The data presented in Table 5 portrays association between premarital and obstetrical history with anemia. Pearson Chi-square test was used to calculate the association. There was significant association between anemia and premarital and obstetrical history such as age at menarche (χ^2 =13.74, p=0.001), menstrual flow (χ^2 = 22.93, p=0.000), menstrual duration (χ^2 = 6.532, p=0.038).

DISCUSSION

Anaemia is the most prominent haematological manifestation of pregnancy, delivery and heralded cause of gestational complications and adverse birth outcomes. In this study, the overall prevalence of anemia among antenatal mothers was 79.5%. A study by Nutrition Foundation of India [23] and ICMR Task Force [3] observed the prevalence of anemia as 84% and 84.9% among pregnant women, respectively. Similar results were obtained in a study by Gautam *et al*. [24] (96.5%),

Lokare *et al*. [25] (87.2%), and Mangla and Singla [26] (98%). The high prevalence of anemia in this study was mostly related to low sociodemographic factors, obstetrical history, and dietary habits.

On the contrary, in developed countries, the prevalence of anemia was only 18% among pregnant women as reported by the WHO.[27]

In the present study, all antenatal mothers were divided according to the level of anemia. It has been found that mild, moderate, and severe anemia account for 31.2%, 38.3%, and 10%, respectively. The result is higher than a study conducted by the WHO,[27] Desalegn,[28] and Lokare et al.[25] where moderate anemia accounted for 68%, 74.3%, and 54.5%, respectively.

In the present study, majority of antenatal mothers belonged to the age group of 24–27 years (38.7%). It is comparable to the studies by Ayano and Amentie,[29] Obai et al.,[30] and Getahun et al.[31] This may be due to the recurrent pregnancies and poor birth spacing in reproductive age women which make them more prone to anemia in our study.

Incidence of anemia was observed to be the highest in Hindus (42%), followed by Christians (34%). Anemia was least prevalent in Muslims (6%). A low prevalence of anemia in Muslims when compared to Hindus was also observed by Lokare et al.[25] in a study based in Karnataka. They attributed this phenomenon to a probable difference in the dietary patterns of the two religious' populations.

Many studies, including that by Suryanarayana *et al*., [32] document an increase in anemia in pregnant women with increasing gestational age. However, contrary to the above, the prevalence of anemia in the studied population was seen to decrease with an increase in the duration of gestation. A similar observation was also made by Vemulapalli and Rao[33] in a study based in Andhra Pradesh where they documented the least incidence of anemia in the third trimester. The rising trend in hemoglobin levels with increasing gestational age was analyzed in conjunction with the registration of all participants at their respective subcenters and primary health centers.

CONCLUSION

The present study concludes most of the antenatal women attending antenatal clinic were anaemic which is a serious public health problem. To prevent this anemia control program should be executed more resourcefully in this vital segment of population. Efforts should be aimed toward the early diagnosis and treatment of anemia well before the time of full term delivery. Some of the measures have been suggested to prevent anemia such as screening programs for anemia, health awareness campaigns, frequent visits by Anganwadi workers to pregnant women, cooking food in iron utensils, fortification of food with iodized salt, and iron folic acid supplements. Such measures would go a long way in improving maternal health as well as health of the baby. All these efforts would help to ensure safe motherhood and achieve the target development goals of the millennium.

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