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Assessment Of Prevalence Of Anemia In Rural Areas And Exploring Clinical Pharmacist Mediated Education On Nutritional Deficiencies Intended For Better Maternal And Fetal Outcomes

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Abstract:
Introduction: *Anaemia is a health complication influencing global countries and 80% of pregnant are being diagnosed as anaemic due to different circumstances results in adverse maternal and fetal complications. In India the pregnant women suffering with mild anaemia is23.3%, moderate anaemia is 56.6% and severe anaemia is 20%, particularly rural areas of India are most predictable regions due to conditions such as poverty, illiteracy, malnutrition etc. This study aims to identify prevalence of anemia*
Methodology: *A 6 months interventional study conducted in the rural areas of Ananthapuramu district. Pregnant women of all trimesters were included based on study criteria and Data was collected during baseline and follow up visit and counselled by giving information leaflet. The data obtained was analysed by graphpad instat.*
Results and Discussion: *Out of 680 participants, 102 pregnant women were severe anemic. During follow up visit, out of 390 women belongs to second and third trimester, 310(79%) women were in mild, moderate and severe anemic condition and faced complications such as 98 women experienced PPH,16 aborted,68 women faced labor obstruction and 12 pregnant women delivered LBW babies. Number of women with normal haemoglobin levels increased during the follow up visit (48%)*
Conclusion: *Prevalence of anaemia in rural pregnant is a root for maternal complications and this study showed that lack of knowledge is a main factor and pharmacist mediated counselling plays imperative role in improving knowledge on importance of hemoglobin and diet*
Key words*: Post partum Hemorrhage, low birth weight, prevalance, trimester*

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I. Introduction

Anemia is a global health complication influencing both developed and developing countries [1]. It is considered as one of foremost cause for loss of life in several chronic conditions. Anemia during pregnancy is a consequential root source for maternal morbidity and mortality.pregnant women are at an extreme risk for developing anemia due to the increased amount of blood supply demands of the body. Approximately 80% of conceive women are being diagnosed as anaemic due to different basis of circumstances [2]. . According to WHO classification, anaemia is designated as haemoglobin level of less than 13.5 gm/dl in men and less than 12.0 gm/dl in women and the resultants will be considered as anaemic [3]. Anemia is characterized as a medical condition in which there is insufficient healthy red blood cells are present to carry oxygen to the tissues in the body [4].Nutritional status of pregnant women is also a pivotal point in anaemic condition as body requires folic acid, iron, and vitamin B12 and these nutrients are supplied from external sources such as from food intake [5]. Iron contributes major role in developing immune resistance of both mother and fetus in order to fight against various diseases and underdeveloped conditions [6]. Mostly many of pregnant women exposed to iron deficiency anaemia due to low amount stores of iron mineral during conception period which may leads to fatal complications such as [7]Difficult labour, Miscarriage, Abortion, Extreme bleeding. Folate deficiencies and hydroxycobalamine deficiencies are considered as second most causes which account for other considerable types of anaemia [9]. For pregnant women anaemia is one of major contributing factor in maternal morbidity and mortality and can show its action on both somatic and neurological performance [10] A healthy non anaemic mother may tolerate blood loss up to a litre whereas an anaemic mother cannot tolerate to this extent and

external blood supply is required for secure labour. The WHO has determined that the prevalence of anaemia in pregnant women is 13 percent in developed countries and 48 percent in developing countries. Iron deficiency is the most common cause of anaemia in pregnancy accounts for 75 to 95 percent of all cases. In India the pregnant women suffering with anemia ranges from 60-80%, particularly rural areas of India are most predictable regions due to various circumstances such as poverty, illiteracy, malnutrition etc.This study helps to identify the anaemic status in pregnant women and counsel them about importance of haemoglobin levels and the complications caused due to low hb status which leads to several maternal and fetal defects. Clinical Pharmacist plays an important role in counselling pregnant women and can develop a responsible patient care including of pharmacological and non-pharmacological management and in ensuring pregnant women about taking medications and also about contraindicated drugs. Lack of proper Counselling is also an important leading factor in poor pregnant outcome. In the end the ultimate goal of the current study is to increase the haemoglobin concentration to evade surplus health problems for both mother and baby.

II. Aim And Objectives

2.1 AIM:

The main aim of the study is to identify the prevalence of anaemia and to educate the pregnant women about taking nutritious dietary regimen to reduce maternal and fetal complications

2.2 Objectives:

- The main objective of the study is to assess haemoglobin levels and the prevalence of anaemia in pregnant women and to observe hemoglobin levels during pregnancy stages and counsel about the importance of consuming iron and folic acid
- To study the prevalence of anaemia in pregnant women in each trimester.
- To educate the pregnant women about the health benefits of taking good nutritious food like taking vitamins, calcium and protein rich foods.

III. Methodology

STUDY SITE: The study was conducted in some of the surrounding rural areas of anantapuramu district
SAMPLE SIZE: In order to assess the prevalance of anemia, a sample size of 728 pregnant women was computed with 95% confidence level, 5% margin of error
STUDY DESIGN: Prospective interventional study
STUDY DURATION: This study was conducted for a period of 6 months from august 2018 to January 2019

INCLUSION CRITERIA:
Pregnant women of all trimesters are included.

EXCLUSION CRITERIA:
Pregnant women who are having other complications like

- gestational diabetes
- low amniotic fluid
- preeclampsia
- Hypothyroxinemia are excluded from the study.
- Pregnant women who are not willing to participate in the study

Procedure methodology:

A prospective interventional study was conducted in surrounding rural areas of anantapuramu district. This study protocol was clearly explained to pregnant women and their representatives and the data was scrutinised with collaboration of anganwadi centres and primary health care centres of rural areas. A total of 728 patients were enrolled in the study based on inclusion and exclusion criteria. All demographic data regarding age, bodyweight, age at marriage, age at first pregnancy, birth interval, food habits, educational status, and occupational status, type of family, Hb levels, gravida history and knowledge on iron supplements was collected in a patient data collection form. Out of 728 participants, 48 members were dropped due to irregular follow up, laboratory reports and other conditions. The baseline and follow up Hb levels were collected by their monthly check up health cards and we also measured blood pressure levels and their health status .Every participant was provided with a questionnaire regarding their knowledge about anemia and counselled them about importance of hemoglobin and nutritious food by providing a leaflet. The demographics, base line and follow up haemoglobin levels were analyzed and complications, weight of the new born babies were also collected.

Statistical Analysis:

Descriptive statistics, correlation co efficient and linear regression analysis was selected to analyze the significant difference. We used graph pad to carry out statistical test

P-value<0.05 was considered as statistically significant results

IV. Results

TABLE: 1 DEMOGRAPHIC CHARACTERISTICS OF ENROLLED PREGNANT WOMEN (N=680)

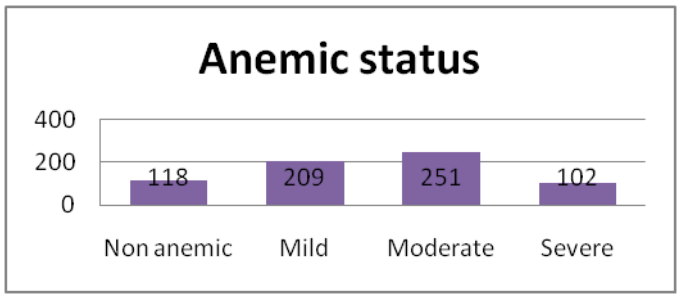
S.NO	PARTICIPANT CHARACTERISTICS	NO.OF SUBJECTS(n=680)	PERCENTAGE
1.	AGE		
	<19	211	31.0%
	20-24	254	37.3%
	25-29	131	19.2%
	30-34	59	8.6%
	35-39	19	2.7%
	>40	6	0.8%
2.	ANEMIC STATUS		
	Non anemic (≥11g/dl)	118	17.3%
	Mild (9-10g/dl)	209	30.7%
	Moderate (7-8g/dl)	251	36.9%
	Severe (≤7g/dl)	102	15.0%
3.	BMI		
	Under weight(<18.5)	228	33.5%
	Normal (18.5-24.5)	281	41.3%
	Over weight(25-29)	152	22.3%
	Obese (>30)	19	2.7%
4.	EDUCATION STATUS		
	Illiterate	281	41.3%
	Primary	235	34.5%
	Secondary	121	17.7%
	Graduation	43	6.3%
5.	OCCUPATION		
	House wife	210	30.8%
	Daily wage worker	102	15%
	Farmer	121	17.7%
	Employee	112	16.4%
	Business	84	12.3%
	Others	51	7.5%
6.	GRAVIDA STATUS		
	G1	275	40.4%
	G2	176	25.8%
	G3	135	19.8%
	>G4	94	13.8%
7.	TYPE OF FAMILY		
	Nuclear	238	35.0%
	Joint	442	65.0%
8.	FOOD HABITS		
	Vegetarian	292	42.94%
	Mixed	388	57.0%
9.	DURATION OF PREGNANCY		
	<12 weeks	258	37.9%
	13-24 weeks	181	26.6%
	>25 weeks	241	35.4%
10.	BIRTH INTERVAL		
	< 1 year	355	52.5%
	1-3 years	246	36.1%
	>4 years	79	11.6%
11.	AGE AT MARRIAGE		
	<or equal to 18 years	102	15.0%
	19-24 years	284	41.7%
	25-29 years	251	36.9%
	>30 years	43	6.3%
12.	AGE AT FIRST PREGNANCY		
	19-24 years	331	48.6%
	25-29 years	325	47.7%
	>30 years	24	3.5%

13.	TAKING OF IRON SUPPLEMENTS		
	NO	138	20.2%
	YES, but irregular	295	43.3%
	REGULAR	247	35.5%
14.	KNOWLEDGE ON IRON SUPPLEMENTS		
	Yes	276	40.5%
	No	404	59.4%

4.1. Anemic status:

Out of 680 participants, 118(17.3%) non anemic, 209(30.7%) were mildly anemic, 251(36.9%) were moderately anemic and 102(15%) were severely anemic as shown in (figure.1)

FIGURE: 1 ANEMIA CATIGORIES DISTRIBUTION AMONG THE PATIENTS.



Out of 680 participants, 118(17.3%) belongs to non anemic, 209(30.7%) were in mild condition, 251(36.9%) were in moderate condition and 102(15%) belongs to severe anemia

TABLE: 2. DISTRIBUTION OF PREGNANT WOMEN ACCORDING TO ANEMIC STATUS AND TRIMESTERS

TRIMESTER	NON ANEMIC (≤11g/dl)	MILD (9-10g/dl)	MODERATE (7-8 g/dl)	SEVERE (≤7g/dl)	TOTAL (n=680)
I trimester	38 (14.7%)	54(20.9%)	102(39.5%)	64(24.8%)	258(37.9%)
II trimester	44(24.3%)	61(33.7%)	51(28.1%)	25(13.8%)	181(26.6%)
III trimester	36(14.9%))	94(39.0%)	98(40.6%)	13(5.3%)	241(35.4%)

FIGURE: 2. DISTRIBUTION OF PREGNANT WOMEN ACCORDING TO TRIMESTERS AND ANEMIA STATUS

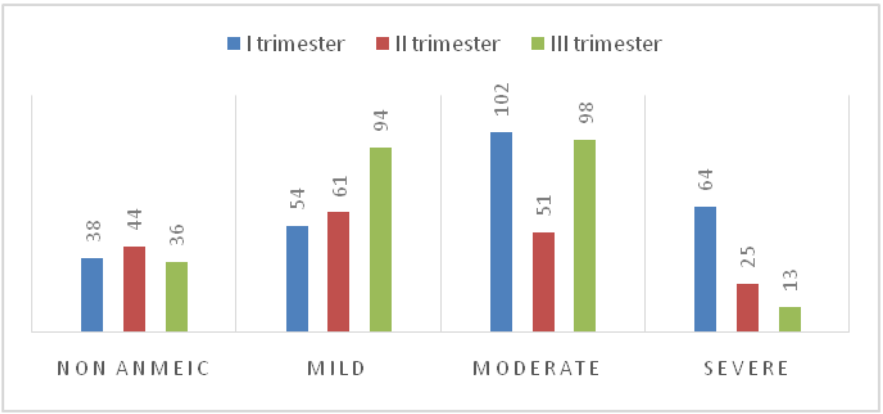


TABLE: 3. ASSESEMENT OF HEMOGLOBIN LEVELS OF PARTICIPANTS DURING BASELINE AND FOLLOW UP:

HEMOGLOBIN LEVELS	BASE LINE	FOLLOW UP
SEVERE(<7)	102(15%)	99(14.5%)
MODERATE(7-8)	251(36.9%)	248(36.4%)
MILD(9-10)	209(30.7%)	203(29.8%)
NON ANEMIC(>11)	118(17.3%)	130(19.1%)

FIGURE: 3. HB LEVELS OF PARTICIPANTS DURING BASE LINE AND FOLLOW UP

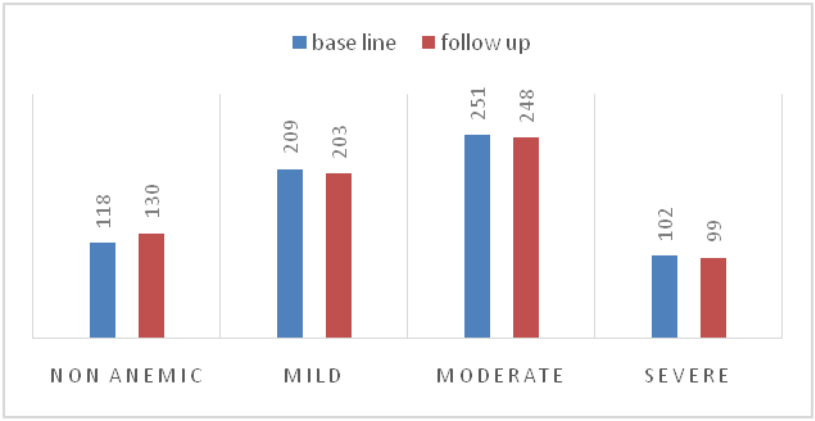


TABLE: 4. COMPARISON OF HB LEVELS AND ANEMIA SEVERITY OF PREGNANT WOMEN AT BASE LINE AND FOLLOW UP

Mean base line score+standard deviation (SD)	**Mean follow up score+standard deviation(SD)**	**P-VALUE**
36.79 ±1.58	39.26 ±2.17	<0.0001

The mean values and standard deviation of base line and follow up results were compared by using graphpad instat software and observed that there is improvement in haemoglobin levels when compared to base line and follow up. . The haemoglobin level scores were improved from 36.79±1.58 to 39.26±2.17 and this was statistically significant according to instat software (p value-<0.0001)*(Table.6)

TABLE: 5. DISTRIBUTION OF COMPLICATIONS AMONG PREGNANT WOMEN:

S.NO	COMPLICATIONS	NORMAL (n=80)	ANEMIA (n= 310)	TOTAL (n=390)
1.	PPH	26(20.9%)	98(79%)	124
2.	LBW	0(0%)	12(100%)	12
3.	LSCS	20(15.6%)	108(84.3%)	128
4.	Abortion and still births	4(20%)	16(80%)	20
5.	Obstructed labour	29(29.8%)	68(70.2%)	97
6.	PMD	1(14.2%)	6(85.7%)	7
7.	Birth asphyxia	0(0%)	2(100%)	2

In this study, out of 680 participants, 390 participants were delivered and most of the pregnant women encountered with maternal and fetal complications and majority of them are anemic.(Table.5)

FIGURE: 4. DISTRIBUTION OF COMPLICATIONS AMONG PREGNANT WOMEN

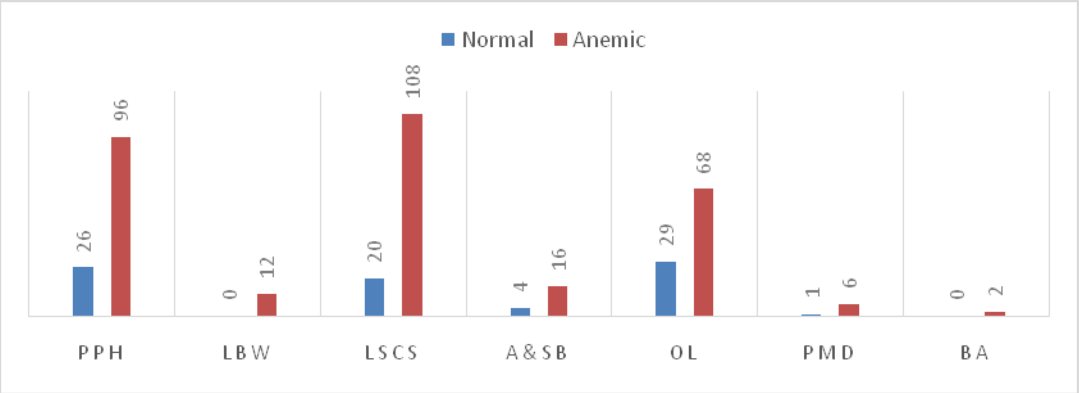


TABLE: 6.BIRTH WEIGHT OF NEW BORN:

WEIGHT OF BABY	NON ANEMIC (n=36)	MILD (n=92)	MODERATE (n=98)	SEVERE (n=13)	TOTAL (n=239)
<2 kgs	-	-	3(25%)	9(75%)	12
2-2.5kgs	4(8.8%)	13(28.8%)	26(57.8%)	2(4.5%)	45
>2.5kgs	32(17.2%)	79(42.7%)	72(38.9%)	2(1.08%)	185

Out of 680 pregnant women,258 belongs to I trimester,181 belongs to II trimester and 241 participants belongs to III trimester and 3 members are excluded as their babies died within week after birth. The pregnant women who were in III trimester were delivered babies and their weights were noted.
In present study, nearly 35.4% participants belong to third trimester and they were followed up to one week after delivery.

V. Discussion

WHO reports shows that 35 – 75% of pregnant women in developing countries are anaemic and India has the highest prevalence rate of anaemia. In the present study, a prevalence rate of (82.9%) was observed. Similarly R.G.Viveki (82%),[21]Agarwal (84%)[22]f prevalence rate was seen .In contrast very high prevalence observed by Gowtham et.al (96.8%)[23]and low prevalence in Nepal (42.5%) is observed by prashant D et.al.

In the present study 680 participants were taken. The age varies from 19 to 40 yrs. The majority of the patient's are 37.3% that is the age between 20-24 which correlates with shri Devi (58.3%) and Ravi Shankar suryanarayana et.al,[2] (48.2%) the knowledge of iron supplements are not satisfactory as 59.4% of pregnant women have poor awareness about iron supplements. 40.5% of women are having a good knowledge about iron supplements Which contrast the Ashly Baby (54%)[24]of pregnant women having a satisfactory knowledge and (38%) are having a not satisfactory knowledge . Similar study was under taken by Kalimbira AA, who showed that the majority of pregnant women (96.6%) were aware while (4%) were not aware of taking iron supplements.

The important risk factor for poor pregnancy consequences and fetal morbidity is maternal anemia. According to available data sources from India, maternal anemia is a foremost reason for severe maternal complications [1, 2] .In the present study , 35.2% of the women had postpartum hemorrhage, 19% of women had LSCS, prolonged labor, pre mature delivery, low birth weight , abortion and still births, obstructed labor were frequently seen among anemic pregnant women. There is a considerable level of evidence showing that iron deficiency anemia was most common widespread type of anemia in pregnancy and at early pregnancy can results in low birth weight and premature delivery [3] in the present study, nearly 22% of pregnant women delivered low birth babies and the majority of them are anemic women (54%).

A study by nair in Assam reported highest (42%) prevalence of low birth weight among pregnant women was observed, whereas marahatta in Nepal observed least (16.6%). Some other complications in this study were pre mature delivery and birth asphyxia. In present study it was observed that low birth weight babies (<2kgs) born to severe (<7g/dl) anemic women which correlates with study by sangeetha in Bangalore with highest prevalance rate

VI. Conclusion

The final conclusion of our study was that high prevalence of anemia in pregnant women clearly states that anemia is one of major health problem in pregnant women for complicated delivery. Lack of knowledge of taking iron folic acid supplements (59%) in rural pregnant women is a main indication for failure to health programs conducted in rural areas of India. This can be prevented by counselling about proper antenatal services in the early stages of pregnancy. Growth in education and knowledge is main inspective for better and healthy pregnancy outcome.

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