

Original Research Article

ANEMIA IN PREGNANT WOMEN PREVALANCE AND ASSOCIATED RISK FACTORS IN THE TRIBAL COMMUNITY

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ABSTRACT

Background: Anaemia is considered as a major public health especially in women with reproductive age group.^[1] The aim of this study is to estimate the prevalence of Anaemia and its associated risk factors among pregnant women in tribal population.

Materials and Methods: Epidemiological study was done on 100 pregnant women who are attending Obstetrics and gynaecology OP and ward during one year from 2024-2025 using a systematic random sampling technique. A predesigned, pre-tested, semi-structured, Interviewer-administered questionnaire containing different sections namely socio-demographic details, Dietary history, menstrual history, obstetric history, antenatal history, medical history, behavioural history and personal history was used. To estimate the prevalence, haemoglobin levels were analysed using hemoglobinometer, serum ferritin levels are estimated to know the iron stores.

Results: The overall prevalence of anaemia among pregnant women in tribal community is 53.33%. The relative prevalence of mild, moderate and severe anaemia was estimated as 25.1%, 24 % and 4.23% respectively.

Conclusion: A baseline data is generated from this study giving a clear picture of the exact prevalence and the risk factors associated with anaemia among pregnant and lactating females. This would help the policymakers to make modifications imperative to improve the nutritional status of pregnant women and hence the children.

Keywords: Anemia, Pregnant women, Iron deficiency, Folic acid, Haemoglobin, Sick Cell Anemia, Low birth weight, Multi parous, Primi, Sickling test, Serum Ferritin, Deworming, Pan chewing.

INTRODUCTION

Of the many health problems affecting pregnant women in India, anaemia is considered as a major public health concern. Internationally it was pronounced that, out of all the population at-risk of anaemia, it is only among pregnant women that anaemia is a public health problem.^[1] Anaemia is a condition characterized by a deficiency in the quantity of red blood cells or a decrease in the concentration of haemoglobin inside these cells, resulting in levels below the established normal range. The presence of haemoglobin is essential for the transportation of oxygen.^[2] According to the

world health organization report, the prevalence of anemia is estimated to be in a range of 41.96-57.19% with an average of 50.13% among pregnant women in India.^[3] World Health Organization (WHO) also stated that, about 2 billion people are affected with anaemia, making it a serious public health issue. Lack of nutrition is one of the most frequent causes of anaemia. Iron deficiency anaemia is a significant indicator of poor health status and is largely caused by poor eating habits.^[5] Due to their increased need for iron throughout growth and puberty, children and adolescents are more likely to acquire iron deficiency anaemia.^[6] India is still among the nations with a very high incidence. Generally speaking, the term "tribe"

refers to a "socially coherent unit, associated with a region, the members of which see themselves as politically autonomous".^[8] Due to illiteracy and ignorance, tribal women in India are greatly disadvantaged (Kupputhail and Mallika 1993).^[9] The National Family Health Survey (NFHS)-5 data (2019-21) indicates that 52.2% of pregnant women in India are anaemic. This prevalence is higher than the overall prevalence of anaemia in women aged 15-49 years (57.0%), and also affects children aged 6-59 months (67.1%) and adolescent girls (59.1%). World Health Organization (WHO) classification according to the severity of anaemia during pregnancy is based on the haemoglobin levels: severe anaemia – Hb level below 7 g/dL; moderate anaemia – Hb level 7 to 9.9 g/dL; mild anaemia – 10 to 10.9 g/dL. Effects of Anaemia in pregnancy are PIH, Pre-eclampsia, pre-term labour, Post-Partum haemorrhage, puerperal sepsis, embolism, cardiac failure, risk of pre maturity, IUGR, low birth weight baby, fetal distress, failure to thrive and poor IQ. The tribal population mostly lives in scattered clusters across hills and unreachable. Due to which, they have remained beyond the scope of the general development process, lacking the basic facilities like access to healthcare, pure drinking water, and education and their typical socio-cultural beliefs resulting in extremely poor socio-economic conditions and undernutrition including anaemia. In this context, it is essential to conduct comprehensive research to evaluate the risk factors, causes, and consequences of anaemia among tribal populations and helps to reduce the maternal mortality and child mortality.

Aims and Objectives

1. To estimate the prevalence of anaemia among pregnant women in tribal populations.
2. To identify the risk factors and causes of anaemia among tribal populations.

Review of Literature

Several studies conducted across different regions of India highlight the prevalence and complications associated with anaemia in tribes, underscoring its significance as a public health concern.

1. A study by Mangla et al. conducted a prospective observational study among 850 participants and concluded that only 2 % of the total pregnant female at term had haemoglobin above 11mg/dl. So, prevalence of anaemia was 98% among the pregnant females in this region of rural Haryana. Out of these 41.76% had mild anaemia, 37.05% had moderate anaemia, 15.88% had severe anaemia and 3.29% very severe anaemia according to ICMR classification of anaemia. The prevalence of anaemia in pregnant females in the age group 15-19 years was 95.4%. Out of the total anaemic women in this age group 64.6% had severe anaemia, 12.3% had moderate anaemia and remaining 64.6% had severe anaemia.^[10]
2. A study by Sinha et al. conducted a Cross Sectional Study among 200 pregnant women and concluded that 90% suffered from anaemia;

majority had moderate anaemia (60.5%), followed by mild anaemia (29%). Only 1 woman was suffering from severe anaemia, while the rest had no anaemia. And also stated the Association of anaemia with low socioeconomic status was found to be 63.93%, 51.72% and 35% for severe and moderate, mild and no anaemia respectively which was statistically significant [$P = 0.03$].^[11]

3. A study by Nayak MDSP et al. conducted a cross-sectional study conducted in ITDA Paderu division of Visakhapatnam district among the reproductive age group tribal women during the period from April 2014 to October 2014 among 225 pregnant women and concluded that the prevalence of anaemia is 60%.^[12]
4. A Study by Kotwal et al. Concluded that high prevalence of anaemia i.e., 97.21% among pregnant mothers.^[13]

MATERIALS AND METHODS

Study Design: Epidemiology Study

Study Setting: Tribal Tertiary care Hospital

Study Population: The Patients attending Obstetrics and gynaecology OP and those who are admitted In Obstetrics and gynaecology Ward in Government General Hospital in a tribal area.

Study Period: The study has been conducted for one year i.e. from 2024-2025.

Sample size: A convenient sample of 100 pregnant mothers who are attending Obstetrics and gynaecology OP and ward.

Inclusion Criteria: All pregnant women between 20-45 years who were willing to give written and informed consent will be included in the study.

Exclusion Criteria: The exclusion criteria will be mothers who are not willing to participate in the study were excluded.

Sampling Technique: Systematic random sampling will be followed.

Ethical considerations: Approval from the institutional ethics committee is obtained before commencement of the study. The study participants were explained the purpose of the study, and written consent is taken from the subjects in the local language after briefly explaining the purpose of the study. Approval from the head of the institute and head of the department is taken before starting the study. Confidentiality of the study participants is maintained strictly throughout the study. This study is purely descriptive in nature, and no drug intervention is included.

Method of collection of data: A pre-designed, pre-tested and semi-structured questionnaire will be used for collecting the required data, by face to face interview from the ante natal mothers after briefly explaining the purpose of the study till the required sample size is achieved. All the study participants will be subjected to clinical and obstetric examination

along with detailed history to satisfy the inclusion and exclusion criteria.

Physical Tools: Before starting the study, all physical instruments and techniques used were regularly standardized through-out the period of collection of data. The validity of the questionnaire was pre tested by conducting a pilot study among 25% of the sample size. Data on physical characteristics, socioeconomic variables, antenatal factors and menstrual history were included in the questionnaire.

Instruments: Flexible measurable tape, adult weighing scale and Haemoglobin values.

After physical examination, 5ml of blood will be collected in a sterile vacutainer from selected patients and will use the sample for the analysis of the following parameters:

1. Haemoglobin values measured on their first trimester and again at the time of delivery. Haematology analyser with cytometry method is used for Haemoglobin analysis.
2. Sickling Test is performed to exclude Sick cell Anaemia.
3. Stool Culture is performed for Worm induced anaemia cases.
4. Serum Ferritin levels were analysed to know the iron stores.

Data Analysis: Data will be entered in Microsoft excel and analysed by using Epi info software version 7.2.5. Results will be expressed in the form of tables and figures. Statistical tests will be done wherever they are appropriate to test the significance of the results.

Implications of the study: Because of the high prevalence of anaemia among the tribal populations, it calls for the need of urgent attention and action to address this public health issue. Effective interventions, like iron supplementation, nutritional education, and disease and infection control measures, should be enforced to lessen the burden of anaemia in this population and reduce the maternal mortality and child mortality.

RESULTS

Prevalence of anaemia in the study population (N=100) was found to be 53.33%. The relative prevalence of mild, moderate and severe anaemia was estimated as 25.1%, 24% and 4.23% respectively. The mean haemoglobin value among the 100 subject samples studied was 10.6gm%. The median haemoglobin was found to be 10.8±1.38 gm%. Among 100 pregnant tribal women participated in the study, the mean age of study group was 25.8 with majority subjects (46.7%) lies within 20-24 age group.

Physical characteristics of subjects: Among the study population, 63% were found to be underweight and the mean weight of the study population was 40 kg. The median weight was 40±6.9 kg. The mean BMI of the study population was 17.78 kg/m². Our

study reported that around 2.4 times there is increased chance of developing anemia in women who are underweight when compared to those with normal BMI. There is increased incidence of anemia among multi gravidas women when compared to the primi gravidas women. Multiparous women have 3.5 times more chance of developing Anemia compared to primi gravida and second gravid women.

Dietary habits: In one hundred participants, they were non-vegetarians (37.8%) and vegetarian (73.2%) were primarily rice eaters. Out of hundred pregnant women, only fifty five members (55.7%) of the pregnant females included jaggery in their diet. Sixty five participants (65.1%) ate millets, (24.1%) ate green leafy vegetables (GLV) daily, (20.8%) ate soybean daily. Only (46.4%) among them consumed iron-rich dry fruits, 66.2% of them included iron-rich fruits in their diet, (58.8%) never ate citrus fruits, and Consumption of green leafy vegetables was found to be significantly low.

Behavioural and personal factors: Sixty nine participants (69.5%) subjects out of 100 practiced handwashing before eating, 79.7% practiced washing of fruits and vegetables before consuming them raw, 33.8% used motor to draw their drinking water, followed by 27.3% who used hand pump and 20.9% who consumed well water, 63.1% among them practiced purification of water before consumption, 79.5% subjects practiced handwashing with soap after using washroom, and 67.5% did not take bath daily. These factors were not found to be statistically significant (P-value > 0.05).

Antenatal risk factors of anaemia: Our study claims that 82.5% of the study population had regular intake of iron and folic acid supplements. Undoubtedly, we report that irregular intake of iron and folic acid supplementation during pregnancy significantly foster the chance for anaemia (p<0.001). Anaemia was significantly more in women who haven't not deworming and less prevalent in those women who had followed regular de worming schedule. Among those women who have not taken anti- helminths, the percentage of mild and moderate anaemia patients was as high as 28.1% and 40.4 % respectively.

Menstrual history: In our study, 33.3% of the study population had heavy menstrual bleeding. Those subjects with a history of heavy menstrual flow showed high prevalence of mild (42.5%) and moderate anaemia (32.5%) in our study. Those women with heavy menstrual bleeding had six times more chance of developing anaemia during gestation compared to those with normal menstrual bleeding. We could not find any significant association between age of menarche and irregular menstrual cycles with the development of anaemia. The multivariate association of various statistically significant factors like deworming, exposure to pan chewing and history of heavy menstrual bleeding, shows they are independent risk factors for anaemia .

DISCUSSION

The current study we found that the relative prevalence of anaemia among the 100 study subjects of pregnant women of tribal population at ASR district is 53.33%. Among the anaemic persons, majority cases were of mild anaemic (25.1%) immediately followed by moderate anaemia (24%) and a small proportion of population who had severe anaemia (4.23%). In a cross-sectional study conducted at Karnataka in 2019, majority (89%) of the tribal women under study had anaemia in which 62% and 11% of tribal women had moderate and severe anaemia, respectively.^[14] A very high anaemia burden of 92.4% was reported by Correa et al among pregnant women in the forested tribal areas of Andhra Pradesh, Telangana and Chhattisgarh in India.^[15] Current study observed that there is a statistically significant association between multi parity and development of anaemia. In corroboration to our results, Al-Farsi et al stated that high parity is an important risk factor in the development of anaemia in pregnancy based on a retrospective cohort study conducted in Oman. This could be due to the increased susceptibility to haemorrhage and maternal nutritional depletion syndrome associated with the multiple delivery.^[16] The current study shows significant association between the marriage age of tribal women and prevalence for anaemia in favour to the results obtained in a study by Perumal where they reported that increasing age at marriage is a significant protective factor of anaemia among rural pregnant women in India.^[17] It has been reported by Abiselvi et al that women with history of heavy menstrual bleeding have six times more chance of developing anaemia compared with those having normal menstrual flow.^[24] As early marriage and early childbearing affect adolescent nutritional status by lowering their educational attainment and work status which leads to lower-income, low autonomy and high fertility which together affect nutritional purchasing power, nutritional intake and other outcomes.^[18] Therefore, preventing early marriage and early childbearing not only improves women's and children's health but also help to reduce poverty and improve a country's socio-economic status [19]. Anaemia was linked to lower household income and lower husband education in a study.^[20] The low socioeconomic status of the extreme groups has resulted in widespread anaemia and also undernutrition, with women suffering the poorest health outcomes. The association between ethnicity and anaemia was found to be statistically significant (P value = 0.032), Cramer's V=0.09. It is in compliance with the findings reported by Rahman et al.^[21] in their study. This finding may be because of their own traditional dietary habits including the food availability, preferences and the existent economic and educational disparities & specific cultural and health related beliefs are important factors. The association between the presence of comorbidity and

anaemia was found to be statistically significant, OR=0.07 (P-value = 0.003). Similar findings were reported in a study done by Pradhan et al.^[22] This finding might be due to increased haemolysis and chronic strain on blood vessels in case of hypertension and reduced erythropoiesis in hypothyroidism or due to medication side effects. Exposure to either or both passive smoking and pan-chewing are established as risk factors for the development of anaemia among tribal pregnant women. In addition to the prevalence for anaemia maternal exposure to tobacco whilst pregnancy has also been reportedly associated with still birth conditions and can increase the risk of low birth weight.^[23] The regular intake of iron and folic acid supplements was associated with less incidence of anaemia in the present study subjects compared with those who were noncompliant to supplementary iron. Recent study by Abiselvi et al also elicited that women having irregular intake of iron and folic acid supplements have 1.5 % times higher chance of developing anaemia compared to the ones taking supplements regularly.^[24] WHO recommends prophylactic dose of using single dose albendazole (400 mg) or mebendazole (500 mg), as a public health intervention for pregnant women.^[25] Another important aspect for anaemia in pregnant women of tribal community is malaria where the burden of malaria in India seems to be unequally concentrated in tribal areas, as a recent study performed with nationally representative data recently demonstrates that the 8% Indian population living in districts with large tribal areas bear 46% of all malaria cases, 70% of all P. falciparum cases and 47% of all malaria deaths in the country.^[26] Both P.falciparum and P. vivax cause low birth weight and maternal anaemia.

CONCLUSION

The prevalence of anaemia among tribal women attending antenatal clinics in government general hospitals at paderu, ASR district was found to be 53.33%. The relative prevalence of mild, moderate and severe anaemia were observed as 25.1%, 24% and 4.23% respectively. A low level of Serum ferritin is observed which indicates decreased iron storage. The main risk factors of anaemia in pregnant women are figured out to be low body mass index, low family income, high parity, exposure to passive smoking and pan-chewing, irregular intake of iron and folic acid supplements, hyperemesis and absence of deworming and poor hygiene along with the absence of practicing hand hygiene after going to washroom. The data obtained in our study would provide an insight to the health status of tribal population of paderu and further would help the policy makers for devoting to reduce the mortality and morbidity issues among them.

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