



The Inter-relationship between anemia and thyroid disorders in first trimester among pregnant women of tribal area of southern Rajasthan

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ABSTRACT

Aims: Anemia is the main cause behind various obstetrical complication. This is the main reason behind development of hyperthyroidism & hypothyroidism. Many fetal complication arise due to the iron deficiency anemia. The symptoms & signs of this disorder are seen in the first trimester of pregnancy .The results are reflected as complicated & deranged thyroid profile. In this way we can say that anemia along with disrupted thyroid profile becomes very crucial factors reflected as a health problem during pregnancy and can sometimes be fatal.

Methods: This study was done at Pacific Medical College & Hospital which enrolled 120 in the first trimesters of their pregnancy. Based on serum hemoglobin values, test groups were subdivided into anaemic cases of 60 out of 120 and healthy controls of 60 out of 120. Iron and T₃, T₄, and TSH were evaluated for all.

Results: Serum iron, T₃, T₄ and TSH were substantially higher in normal pregnant (non-anemic) women when compared with anemic pregnant tribal women.

Conclusion: In anemic pregnant women, to prevent any complication serum iron and thyroid function should be ruled out in first few months of pregnancy. Normal serum iron and thyroid functions improves neonatal growth barring all the complication of the pregnancy. Our main aim should be focused on improving primary health care pregnancy health care which includes early diagnosis, prevention and treatment of anemia during pregnancy which will result in maternal and fetal benefits.

INTRODUCTION

Udaipur is a city of diverse linguistic spiritual and ethnic groups. The tribal people in the urban locality have iron deficiency anemia in common, specialty in menstruating women. IDA is defined as Hb level less 12 mg/dL in females and less than 11mg/dL in pregnant females. ⁽¹⁾ IDA is associated with reduced tissue iron stores. ⁽²⁾ Iron storage in the body can be assayed by serum ferritin which is iron storage protein. It is very important to determine the cause of anemia before treatment planning one of the main etiological factor of decreased Hb level is hemodilution. Another factor is hypothyroidism which impairs hematologic system. During pregnancy increase iron demand and unequal distribution of iron to fetus also affect IDA Endocrinal changes are also observed during pregnancy. In a normal healthy pregnancy, there is hormonal adaptation to hcG's stimulating effect on TSH receptors which lowers the TSH level in first trimester. There are various other factors like gender, gestational age and laboratory assay procedure which influence thyroid function test ^(3,4). Yu B et al. ⁽⁵⁾ emphasizes that comparing non-pregnant normal population for diagnosis can cause 5.7-18.4 % misdiagnosis in the study. Some study showed conflicting relation between thyroid hormones and anemia. Main aim of the study is testify the role of thyroid hormones in anemia among pregnant tribal women in southern part of Rajasthan in their first trimester.

MATERIAL AND METHODS

A cross-sectional study with 120 patients coming from department of gynecology, study was conducted in department of biochemistry at Pacific Medical College and Hospital, Udaipur. Two groups of pregnant women was made on the basis of serum hemoglobin

value. First group comprised of pregnant tribal women who were anemic and second group were non-anemic pregnant tribal women. A biochemical analysis of serum iron, T₃, T₄ and TSH was done for all patients.

Composition of Study Group: -

- 60 anemic pregnant women in tribal region
- 60 non- anemic pregnant women in tribal region
- Criteria to consider a pregnant women anemic
- Range of Hb (gm/dL)
 - 9-11 gm/dL – mild anemic
 - 7-8 gm/dL – moderate anemic
 - Less than 7 – severe anemic

INCLUSION CRITERIA

- Pregnant women with anemia.
- Women in 1st trimester of pregnancy in tribal region.
- Age group – 18 to 40 years.

EXCLUSION CRITERIA

- Women with history of anemia prior to pregnancy.
- Pregnant tribal women on anti-thyroid medication.
- Pregnant women with thyroid disease, deficiency of iron/kidney disorders and cardiovascular disease.

BLOOD COLLECTION

- Cephalic or median cubital vein is used to withdraw 5ml of Blood.
- The blood is then processed and centrifuge to separate the serum.
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Statistical Analysis

SPSS-21 is used for the analysis.

For assessment of difference between means, Independent t-test was done.

RESULT & DISCUSSION

The study was conducted among 120 anemic pregnant tribal women in Pacific medical college and hospital. The study was done in two groups, in case group (anemic) Hb level was below 11 mg/dL and a control group (non-anemic) with normal Hb level. In control group T₃, T₄, TSH and serum iron were significant higher.

Table 1. Showing result of blood analysis of the two study groups:

Study Variables	Non-Anemic pregnant tribal women Mean \pm SD (60)	Anemic pregnant tribal women Mean \pm SD (60)	P-value
Iron (mcg/dl)	145.69 \pm 6.23	43.23 \pm 6.03	<0.0001
TSH μ IU/mL	3.7 \pm 0.6	1.4 \pm 0.9	0.001
T3 nmol/lit	2.9 \pm 0.5	0.8 \pm 0.2	0.001
T4 nmol/lit	88.9 \pm 9.4	55 \pm 5.1	0.001

Iron deficiency anemia is one of the main cause of poor obstetrical & neonatal complications. Iron deficiency anemia & thyroid disorders also result in poor cognitive development in infants with delayed milestones in newborns. This also affects intellectual skilled in school going children. ^(6, 7, 8) Also, there is increased risk of miscarriage, placental abruption, pre-eclampsia, premature birth and fetal distress in pregnant women with thyroid disorders. ^(9, 10, 11)

The study revealed that in non-anemic pregnant women, serum T₃ and T₄ were lowered. Tang et al. ⁽¹²⁾ performed a cohort study on 723 pregnant women to determine the

relationship between iron deficiency anemia & hypothyroxinemia. In first trimester, inter-relationship of Fe and T₄ was studied. Godinez et al. ⁽¹³⁾ studied the difference in thyroid function in iron deficient anemic patients before and after treating with iron supplements.

CONCLUSION

A strong recommendation and emphasis on ante- natal care visits of pregnant women to rule out iron –deficiency anemia in first trimester of the patient. This will benefit the patient with good maternal and fetal health. This study also ruled out that maternal hypothyroxinemia is high risk factor in first trimester pregnant women with iron-deficiency anemia. Therefore, obstetrical services should be strengthened for better maternal & fetal outcomes.

Conflict of Interest -Nil

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