



Research Paper

Intestinal Parasitic Infestation in Anaemic and Non-Anaemic Pregnant Women –A Comparative Study

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Abstract

Objective: To detect and compare the prevalence of intestinal helminthic infestation between anaemic and non-anaemic pregnant women.

Background: Anaemia is the commonest of nutritional problems worldwide, which is an indirect cause for the high maternal mortality. With this in backdrop, this study was conducted among antenatal patients who had come for check-up in Kamla Raja hospital to find out the prevalence of worm infestation and anaemia and their association.

Material and Methods: Comparative study done in 1000 pregnant women attending antenatal clinic or admitted in Kamla Raja Hospital, in 2 groups- anaemic pregnant women and non anaemic pregnant women. Both group of women during the study period of one and half year were interviewed. The reports of their stool and CBC examination were followed up.

Results: This study was conducted in 1000 pregnant women attending Kamla Raja hospital. Out of the total pregnant women 62.4% were found to be anaemic. Microcytic hypochromic anaemia was found to be the most common. Prevalence of both groups of parasites was found to be higher in anaemic pregnant women (Helminthic parasites 5.3%, protozoal parasites 22.4%) than in non-anaemic pregnant women (Helminthic parasites 1.1%, protozoal parasites 11.1%) and this difference was found to be statistically significant. Usage of sanitary toilets, hand washing before meals was significantly higher in non-anaemic group.

Conclusion: The present study concludes that the intestinal parasitic infestation in pregnancy significantly contributes to anaemia.

Introduction

Anaemia is defined as a reduction in the oxygen carrying capacity of the blood which may be due to a reduced number of red blood cells, a low concentration of haemoglobin or a combination of both⁽¹⁾. It is the commonest of nutritional problems worldwide with its highest prevalence among young children and pregnant women. Kamla Raja hospital is located in a place where nutritional

disease and anaemia are highly prevalent. Out of the total antenatal patients attending Kamla Raja hospital and Madhav dispensary almost 2/3rd are found to be anaemic and this high prevalence of anaemia is an indirect cause for the high maternal mortality.

After 70 years of independence, employment of National iron deficiency anaemia control program which aims at decreasing the prevalence and

incidence of iron deficiency anaemia in women of reproductive age, adolescent centered program and countrywide education awareness drive for improvement in haemoglobin status, number of anaemic pregnant women doesn't appear to decrease rather with increasing population absolute number of anaemic pregnant women is increasing.

So far all the efforts for prevention and cure of anaemia have been concentrated and directed towards deficiency of iron as the cause of anaemia which results in microcytic hypochromic anaemia. However even after supplementation of iron in oral and parenteral form, anaemia prevalence has not decreased and polymorphic anaemia has emerged as the leading presentation in pregnancy.

In order to deal with this issue, investigations into causes other than iron deficiency need to be made across the population. In the developing countries, pregnant women and their children frequently experience a vicious cycle, where nutritional deficiency and repeated infection including parasitic infestations, lead to adverse results that can run in generations. Intestinal parasites are organisms that live in the intestines and derive their nutrients from their host⁽²⁾. World Health Organization (WHO)⁽³⁾ revealed that intestinal parasitic infections are endemic worldwide and have been described as constituting the greatest single worldwide cause of illness and diseases. Parasitic infestation possess a block in the treatment of anaemia in pregnant women, even after supplementing iron and other nutritional supplements.

With this in backdrop, this study was conducted among antenatal patients who had come for check-up in Madhav dispensary and Kamla Raja hospital to find out the prevalence of worm infestation and anaemia and their association. Also to find out association of anaemia with various characteristics of study population like dietary habits, educational status, source of drinking water and state of personal hygiene. Findings of this study, will help in spreading awareness regarding association of intestinal

infestation and anaemia and better approach towards prevention and treatment of anaemia in pregnant women.

Aims and Objectives

- 1) To detect the presence of intestinal parasitic infestation in pregnant women.
- 2) To compare the prevalence of intestinal parasitic infestation between anaemic and non-anaemic pregnant women.
- 3) To identify different species of intestinal parasites in the study and control group i.e., anaemic and non anaemic pregnant women.

Material and Methods

Study Place: Department of Obstetrics and Gynaecology, Kamla Raja Hospital, G.R. Medical College & J.A. Group of Hospitals, Gwalior (M.P.).

Study Subjects: Pregnant women attending antenatal clinic or admitted in Kamla Raja Hospital were selected randomly.

Sample Size: 1000 antenatal women.

Study Design: Clinical hospital based study done in pregnant women attending antenatal clinic or admitted in Kamla Raja Hospital done in 2 groups

- Study Group - anaemic pregnant women (Hb \leq 10 gm%)
- Control Group - non anaemic pregnant women (Hb $>$ 10 gm%)

Study Period: One and half year (Dec 2015 to June 2017)

Inclusion Criteria

- Pregnant women of age between 15-45 years attending antenatal clinic or admitted in KRH, Gwalior.

Exclusion Criteria

Pregnant women of age between 15 - 45 years with

- Initial ANC screening detected that they had any hemoglobinopathy such as G6PD deficiency, sickle cell anaemia and thalassemia.

- Some other cause of chronic blood loss like gastric ulcers, malignancies etc.
- Antepartum haemorrhage.
- Chronic renal disease, chronic liver disease, cardiac disease.

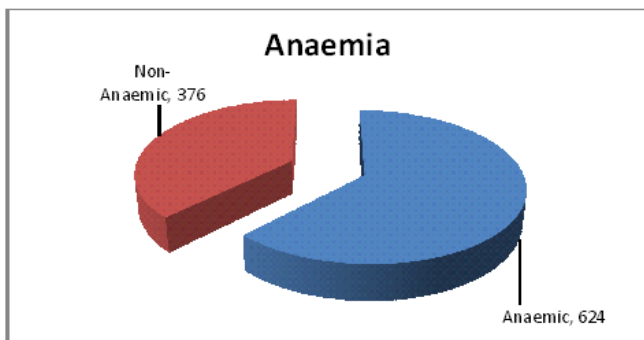
Methodology

Haemoglobin estimation of all the participants of the study was done at central pathology lab, JAH group of hospital. According to the reports of haemoglobin they were categorized as anaemic pregnant women (Hb<10 gm%) and non anaemic pregnant women (Hb>10 gm%). Thereafter peripheral smear was sent for all anaemic pregnant women and stool test was done in all participants.

Observation and Results

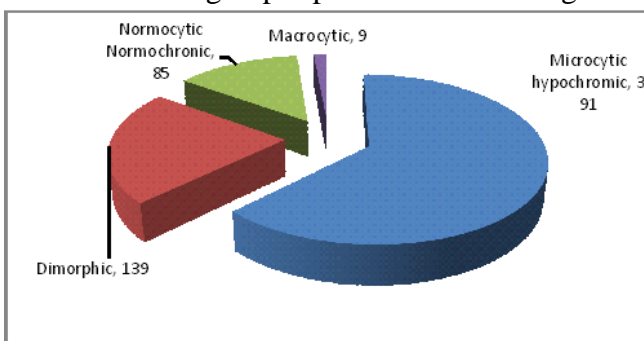
This study was conducted in 1000 pregnant women attending Kaml Raja Hospital and Madhav dispensary. Following are the observations:

1) Prevalence of anaemia in pregnant women



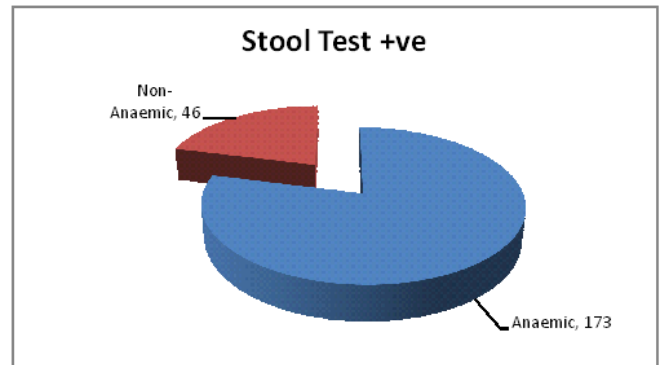
In the present study 62.4% of the pregnant women were found to be anaemic.

2) Distribution of anaemic pregnant women according to peripheral smear findings



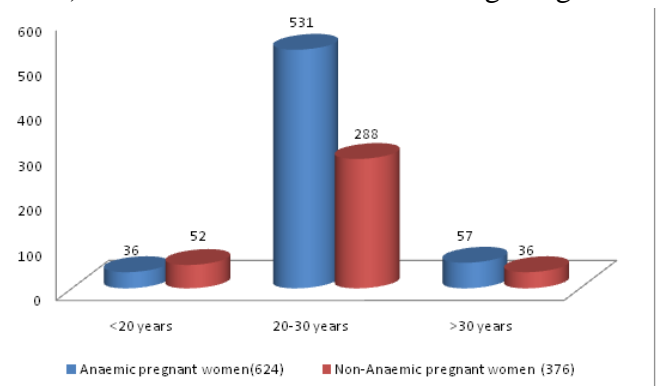
In the present study most common type of anaemia was microcytic hypochromic anaemia followed by dimorphic anaemia.

3) Prevalence of intestinal parasitic infestation.



Out of the total 624 anaemic pregnant women, stool test was positive in 173 of the cases i.e. 27.7%.

4) Distribution of cases according to age



In the current study maximum numbers of the pregnant women were in the age groups of 20-30 years. Mean age of the study group is 24+3.8years.

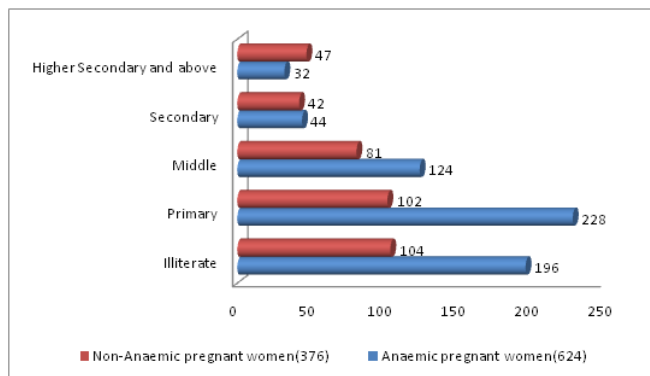
5) Distribution of cases according to parity

Table 1 Distribution of cases according to parity

| | Anaemic pregnant women (624) | Non-Anaemic pregnant women (376) | OR | P VALUE |
|-------------|------------------------------|----------------------------------|------|---------|
| Primi | 232(37.2%) | 167(44.4%) | 1 | |
| Multi | 372(59.6%) | 207(55.1%) | 1.29 | 0.062 |
| Grand multi | 20(3.2%) | 2(0.5%) | 7.17 | 0.004 |

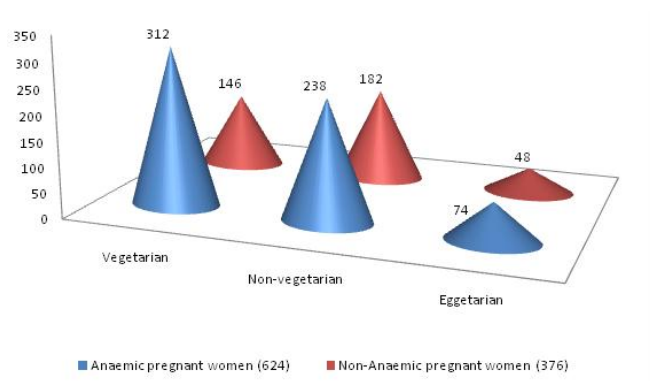
In the present study maximum numbers of pregnant women were multiparous and anaemia was more prevalent in multiparous and grand multiparous women than primiparous women. But the difference was statistically significant only for grand multiparous women (OR→7.17, P-value 0.004).

6) Distribution of cases according to educational status.



In the present study majority of the women had at least primary level of education or were illiterate. Anaemia was more prevalent in women with lower level of education.

7) Distribution of cases according to dietary habit.



In the present study majority of the anaemic pregnant women were vegetarian (50%) and majority of the non-anaemic pregnant women were non-vegetarian (48.4%).

8) Distribution of cases according to source of water.

Table 2 Distribution of cases according to source of water

| | Anaemic pregnant women (624) | Non-Anaemic pregnant women (376) | OR | P VALUE |
|-----------|------------------------------|----------------------------------|------|---------|
| River | 47(7.6%) | 20(5.4%) | 1 | |
| Tap water | 336(53.8%) | 192(51.1%) | 0.74 | 0.361 |
| Borehole | 241(38.6%) | 164(43.5%) | 0.62 | 0.128 |

Major source of water in the present study was found to be tap water and no significant association was found between anaemia and source of water.

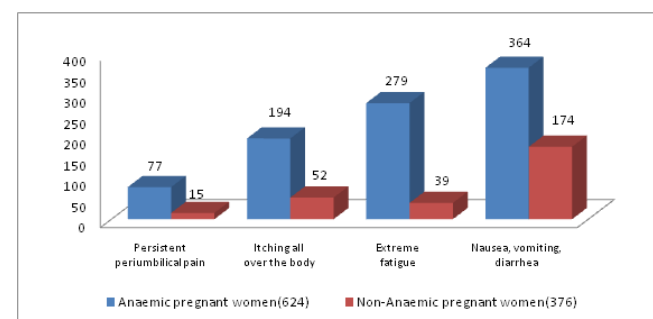
9) Distribution of cases according to usage of sanitary toilets and hand washing before meals.

Table 3 - Distribution of cases according to usage of sanitary toilets and hand washing before meals

| | Anaemic pregnant women (624) | Non-Anaemic pregnant women (376) | OR | P VALUE |
|---------------------------|------------------------------|----------------------------------|------|---------|
| Usage of Sanitary Toilets | 370(59.3%) | 323(86%) | 4.18 | 0.001 |
| Handwashing before meals | 247(39.6%) | 253(67.3%) | 3.1 | 0.001 |

In the present study 86% of the non-anaemic pregnant women used sanitary toilets where only 59.3% of anaemic pregnant women used sanitary toilets. Similarly 67.3% of non-anaemic pregnant women practiced hand washing before meals and only 39.6% of anaemic pregnant women practiced hand washing before meals.

10) Distribution of cases according to complaints suggestive of intestinal parasitic infestation



In the current study complaints suggestive of intestinal parasitic infestation were more common in anaemic than non-anaemic pregnant women.

11) Distribution of cases according to history of pica and eating outside home.

Table 4 Distribution of cases according to history of pica and eating outside home

| History | Anaemic pregnant women (624) | Non-Anaemic pregnant women (376) | OR | P VALUE |
|-----------------------------|------------------------------|----------------------------------|------|---------|
| Eating rocks or clay (Pica) | 468 | 211 | 2.34 | 0.001 |
| Eating outside home | 562 | 312 | 1.86 | 0.001 |

In the present study it was found the pica is more common in anaemic than non-anaemic pregnant women and this is statistically significant. In the

same way maximum number of anaemic pregnant women had history of eating outside the home.

12) Distribution of cases according to stool sample results.

Table 5 Distribution of cases according to stool sample results

| Stool report | Anaemic pregnant women (624) | Non-Anaemic pregnant women (376) | OR | P VALUE |
|--|---|----------------------------------|------|---------|
| No parasite seen | 451(71.5%) | 330(87.8%) | 0.36 | 0.001 |
| Intestinal helminthes | 25(Ascaris ova)(4%), 1(trichuristrichura), 5 H.Nana(0.8%), 2 Taenia | 4(ascaris ova)(1.1%) | 5.19 | 0.001 |
| Other parasites (E.histolytica, giardia) | 140(22.4%) | 42(11.1%) | 2.3 | 0.001 |

In the present study protozoal parasites are found to be more prevalent than intestinal helminths. Although the overall prevalence of intestinal helminthic infestation was very low (3.7%) but the prevalence was more in anaemic than in non-anaemic group and this was also statistically significant.

Discussion

The higher prevalence of anaemia in developing countries like India is of concern as a cause of considerable maternal and perinatal morbidity and mortality. The NFHS3 survey shows that an alarming proportion of pregnant women of our country (57.9%) are anaemic⁽⁴⁾. What is distressing is the fact that the figure has increased a few notches above the NFHS2 figures of 49.7%. The present study shows that a huge proportion (62.4%) of pregnant women were anaemic (Haemoglobin < 10gm %). This is comparatively lesser than that reported in the Sinjita Dutta et al⁽⁵⁾ study conduction in Bengal which showed 82% prevalence of anaemia (Haemoglobin < 11gm %). Going by the other countries –

Table 6- Prevalence of anaemia in pregnant women in other studies

| Study | Prevalence of anaemia in pregnant women |
|---|---|
| 1. Tay et al ⁽⁶⁾ study, Ghana | 54.9% |
| 2. Rodriguez-Morales AJ et al ⁽⁷⁾ study, Venezuela | 65.1% |
| 3. Philomena NI Nwaogu Tina C et al ⁽⁸⁾ study, Nigeria | 58.9% |
| 4. Shah et al study, in Nepal | 58.9% |

In India, reports on the prevalence of intestinal parasitic infestations in pregnant are lacking. In the present study, total prevalence of intestinal

parasitic infections among pregnant was found to be 27.7%. Protozoan parasitic infections were significantly higher (22.4%) than the intestinal helminthic infestation (5.3%).

The finding is consistent with the findings of Sehgal et al⁽⁹⁾ study conducted in Chandigarh, North India, which reported total prevalence of intestinal parasitic infections to be 35.6% in pregnant women attending to the primary health care centers. Similar to our study, Sehgal et al study also reported significantly higher prevalence of protozoal parasitic infections (30%) than the intestinal helminthic infections (5.6%).

The overall prevalence of intestinal helminthic infestation (5.6%) among pregnant women was lower compared to findings from other parts of the world like:

Table 7- Prevalence of intestinal helminthic infestation in pregnant women in other studies

| Study | Prevalence of intestinal helminthic infestation in pregnant women |
|--|---|
| 1. Tay et al ⁽⁶⁾ study, Ghana | 17.6%(MC-Necator Americanus) |
| 2. Wekesa et al ⁽¹⁰⁾ study, Kenya | 13.8%(MC-Ascaris) |
| 3. Van Eijk AM, Linblade KA et al ⁽¹¹⁾ study, Western Kenya | 76.2%(MC-Ascaris) |
| 4. Kiriwanwo Innocent Green et al ⁽¹²⁾ study, Nigeria | 22.7%(MC-Ascaris) |

In the present study only 39.6% of the anaemic pregnant women practiced hand washing before meals. This was lower as compared to the study of Alex Boye et al in Ghana in which 48.7% of anaemic pregnant women practiced hand washing before meals.

In the current study history of pica was present in 75% of pregnant anaemic women which was much higher compared to Alex Boye et al study of Ghana in which only 36.7% of pregnant anaemic women had history of pica.

Conclusion

The present study concludes that the intestinal parasitic infestation in pregnancy is significantly related with anaemia. Hence all women coming to antenatal clinics should be screened for intestinal parasites. Also the protective factors like good dietary habit, use of sanitary toilets, hand washing before meals if addressed at the time of antenatal checkup can reduce the number of cases of anaemia significantly.

Hence the health workers who are the first contacts of these mothers should play a pivotal role in imparting health education regarding the aforementioned protective factors and intestinal parasitic infestation. Distribution of prophylactic/therapeutic iron and folic acid tablets will not help in addressing the problem of anaemia unless other factors are taken care of during pregnancy.

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