Original article:

Study of anemia and it's epidemiological determinants in pregnant women

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Abstract:

Background: Determinants are nutritional, biological & social which contribute poor pregnancy outcomes both for mother & her infant. The evaluation of the pregnant women with anemia requires a careful history & physical examination. Nutritional history related to drugs & family history of anemia should always be assessed certain geographic background & inherited disorders must be taken in to consideration. With this background the present study was designed to assess severity of anemia in rural area depending on hemoglobin & epidemiological determinants in Karad (Maharashtra).

Methodology: 150 pregnant women visiting at Ob.Gynac OPD in Krishna Institute of Medical Sciences, Karad were studied by recording predesigned & structured history of pregnant women with total hemoglobin concentration. All the pregnant women were taking Iron-Folic Acid supplementation throughout pregnancy (100 mg iron/500 µg folate once a day)

Result: percentage of anemia was 43.4 with more prevalence of moderate anemia in 2nd & 3rd trimester.

Epidemiological determinants studied regarding to anemia showed predominantly observed anemic cases were from rural area, age group of 20-25 yrs, from joint family, lower to middle socio-economic class. (Agricultural economy) etc.

Keywords: anaemia, pregnancy

Introduction: Anemia is frequently observed nutritional disease recognized by abnormal screening laboratory tests where hemoglobin concentration < 11 gm% & haematocrit < 33% are diagnostic values in pregnancy.

Classification of anemia according to ICMR is Mild anemia–Hemoglobin concentration 10–10.9gm%, Moderate anemia–Hemoglobin concentration 7–9.9gm% and Severe anemia–Hemoglobin concentration < 7 gm%

Prevalence of anemia in pregnancy shows great variations in different parts of the world. Crude estimation is that 500 million women between 15 to 49 years of age are world wide anemic. According to WHO estimates up to 56% of all women living in developing countries are anemic. In India National Family Health survey 2 in 1998 to 99 shows that 54% of women in rural & 46% of women in Urban areas are anemic. In India the prevalence of anemia has been reported to be in the range of 33% to 89% & more than 60% among adolescent girls with wide variations in different regions of the country. In India about 4 – 16% of maternal death is due to anemia.

Several types of anemia developed during pregnancy are (1, 3).

A) Physiological anemia:- shows normocytic normochromic dilution picture.

B) Nutritional anemia :- Iron deficiency anemia:- Due to deficient intake of iron rich diet. less absorption and deficient iron store from adolescent to post partum stage due to multiple pregnancies & increased demand of iron.

loss of iron by haemorrhage during delivery and chronic blood loss due to
inflammation and various infections like malaria & worm infestation.

Folate & vitamin B12 deficiency anemia:
Folate is the water soluble vitamin which is used to synthesize & repair DNA. It is nutritional deficiency of folate.

C) Protein deficiency anemia: Caused due to malnutrition & less dietary protein intake.

D) Thalassemia & E) Sickle cell anemia: Regional anemia rarely observed during pregnancy caused due to genetic disorder.

F) Aplastic anemia: Hypoproliferative anemia caused due to marrow hypoplasia.

In pregnant women to see the impact of various Socio demographic determinants studies are carried out like family type, socio-economic status, education, occupation, diet. Obstetric determinants like age factor, duration between two successive pregnancies, number of abortions & parity.

Materials & Methods:
A study was conducted among 150 pregnant women in three trimesters visiting at Ob. Gynecology O.P.D. in Krishna Hospital of Medical Sciences, Karad Data was collected by using pre-designed & pre-structured schedule by taking history of the pregnant women for epidemiological determinants:

- a) Age-years,
- b) Height – cm,
- c) Weight – kg,
- d) Age at 1st pregnancy,
- e) Pregnant characteristic (parity),
- f) Gestational age (weeks)–1st, 2nd & 3rd trimester
- g) Family type
- h) Education
- i) Occupation
- j) Dietary habit
- k) Personal habits
- l) Socio economic status
- m) Iron-Folic acid supplementation

2-3 ml. of Venous blood was collected by taking aseptic precaution using EDTA or citrate (anticoagulant) containing bulb.

Total hemoglobin analysis was carried out using fully automated analyzer.

As –
1. Lab life Noble 3 (DIRGNOOR) automated hematology analyzer.
2. Lab life H3d (DIRGNOOR) premier automated hematology analyzer

The women categorized as anemic if the Hb< 11 gm%.

Observation & Result:
Histogram No. 1
Severity of anemia depending on hemoglobin concentration: Observed prevalence of anaemia was 43.4%
Comparison in prevalence of anemia in various regions of India & Other countries

Table: Epidemiological determinant

<table>
<thead>
<tr>
<th>Variable</th>
<th>Degree of anemia</th>
<th>Normal cases</th>
<th>Mild Anemia</th>
<th>Moderate Anemia</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>Current Age Group</td>
<td>&lt;20 yrs</td>
<td>4 (4.7%)</td>
<td>3 (12.0%)</td>
<td>1 (2.5%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20-25 yrs</td>
<td>59 (69.4%)</td>
<td>14 (56.0%)</td>
<td>32 (80.0%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26-29 yrs</td>
<td>18 (21.2%)</td>
<td>7 (28.0%)</td>
<td>3 (7.5%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; =30 yrs</td>
<td>4 (4.7%)</td>
<td>1 (4.0%)</td>
<td>4 (10.0%)</td>
</tr>
<tr>
<td>Parity</td>
<td>Current</td>
<td>47 (66.19%)</td>
<td>10 (41.66)</td>
<td>14 (58.33)</td>
<td>24    (36.92)</td>
</tr>
<tr>
<td></td>
<td>Single</td>
<td>31 (51.66%)</td>
<td>11 (39.28)</td>
<td>17 (60.71)</td>
<td>28    (43.07)</td>
</tr>
<tr>
<td></td>
<td>2&amp; &gt; Children</td>
<td>7 (36.84%)</td>
<td>3 (23.07)</td>
<td>10 (69.23)</td>
<td>13    (20)</td>
</tr>
<tr>
<td>Education</td>
<td>Illiterate</td>
<td>2 (2.4%)</td>
<td>0 (.0%)</td>
<td>3 (7.5%)</td>
<td>5     (3.3%)</td>
</tr>
<tr>
<td></td>
<td>Primary</td>
<td>44 (51.8%)</td>
<td>14 (56.0%)</td>
<td>23 (57.5%)</td>
<td>81    (54.0%)</td>
</tr>
<tr>
<td></td>
<td>Secondary</td>
<td>17 (20.0%)</td>
<td>8 (32.0%)</td>
<td>6 (15.0%)</td>
<td>31    (20.7%)</td>
</tr>
<tr>
<td></td>
<td>Graduate</td>
<td>22 (25.9%)</td>
<td>3 (12.0%)</td>
<td>8 (20.0%)</td>
<td>33    (22.0%)</td>
</tr>
<tr>
<td>Socio Economic</td>
<td>Lower</td>
<td>33 (38.8%)</td>
<td>10 (940.0%)</td>
<td>20 (50.0%)</td>
<td>63    (42.0%)</td>
</tr>
<tr>
<td>Status</td>
<td>Middle</td>
<td>50 (58.8%)</td>
<td>14 (56.0%)</td>
<td>20 (50.0%)</td>
<td>84    (56.0%)</td>
</tr>
<tr>
<td></td>
<td>Upper</td>
<td>2 (2.4%)</td>
<td>1 (4.0%)</td>
<td>0 (.0%)</td>
<td>3     (2.0%)</td>
</tr>
<tr>
<td>Diet</td>
<td>Mix</td>
<td>70 (82.4%)</td>
<td>21 (84.0%)</td>
<td>32 (80.0%)</td>
<td>123   (82.0%)</td>
</tr>
<tr>
<td></td>
<td>Veg</td>
<td>15 (17.6%)</td>
<td>4 (16.0%)</td>
<td>8 (20.0%)</td>
<td>27    (18.0%)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>85 (100.0%)</td>
<td>25 (100.0%)</td>
<td>40 (100.0%)</td>
<td>150   (100.0%)</td>
</tr>
</tbody>
</table>

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Discussion:
In this pilot study we tried to estimate the overall anemia in the pregnant women visiting at Ob. Gynecology OPD. of Krishna hospital from Karad & rural area around it by reviewing the findings of available studies. The overall anemia observed among pregnant women in the present study is lower (43.4%). Out of 43.4% anemic cases, the severe anemic cases observed in this study is 0.7% where as mild anemia 16.7 %, moderate anemia 26%. Such a lower prevalence of anemia in this region may be due to iron-folic acid supplementation through out the pregnancy (3 trimesters) which is the main factor to help the irradiation of anemia in this area. A lower prevalence of anemia in this study observed was mostly from rural area of Karad (Maharashtra). Among 150 cases studied 85.33% were from rural area from which 43.75% cases were anemic & 14.66% were from urban area from which 45.46% cases were anemic which was depends on numerous factors & epidemiological determinants as diet, parity, age, habits, occupation, socio-economic status, education, family type & no. of abortions.

Out of 150 study cases 143 cases (95.4%) were observed to be having iron-folic acid supplementation through out the pregnancy (3 trimesters) & 7 cases (4.6%) from 1st trimester were not having iron folate supplementation so this was the main factor to eradicate the anemia in this area.

As far as diet is concerned out of 150 cases studied 123 (82%) women were having mixed diet (vegetarian + Non vegetarian) with frequency of twice a week where as 27 (18%) cases were having vegetarian diet. In present study prevalence of anemia was from women taking mix diet as the percentage of women taking mix diet was more than women taking vegetarian diet. Family income in this region is from agricultural origin that is (agricultural economy) providing the nutritional & iron rich diet to the pregnant women which is helping to eradicate anemia & giving results of lower percentage. Dietary products are pure milk and milk products, eggs, Jawar, Jaggery, groundnut, wheat, leafy vegetables though these women are in lower and middle economic class. There was no significant difference in anemic and non anemic cases as per as above structures concerned. Example - non anemic cases 78.8% from joint family compared with 82% of anemic cases from joint family with mix diet.

Whereas occupation is concerned out of 150 pregnant women 140 (92%) were house wives from non anemic cases 95.3% and 88-92% anemic cases were also house wives. Cause of anemia may be due to continuous house work & tedious work in the field. As far as education is concerned out of 150 pregnant women most of the women are educated up to primary level having (57.5%) anemia but as per non anemic cases 51.8% are also educated up to primary level. This low level of educational status reduce the maternal awareness like regular ANC visits & to maintain personal hygenicity. Out of 150 cases studied 93% women were from Hindu category where 7% in other religion.

Above observations indicates that these socio-demographic factors like, family type, socioeconomic state, education, occupation religion etc. showing no much difference in percentage of anemic and non anemic cases, as per chi square values and statically analysis P value is >0.05, so epidemiological determinants did not show statistically significant difference for anemia during pregnancy in this region. Other gynecological
determinants including the parity 76% of women were having previous baby that is current pregnancy and 23% from more than 1-2 children were anemia observed in multipara women .This observation may be due to blood loss during successive deliveries hence reduced hemoglobin & so there is depletion of iron storage.

Out of 65 anemic women 7 (11.67%) cases were found to have abortions in previous pregnancies but 58(89.23%) women were not having abortions. So this determinant is not significant according to anemia epidemiology.

As the age was concerned among anemic pregnant women 20-25 yrs. age group was predominantly showing more percentage of anemia for current pregnancy and first pregnancy also < 20 yrs age group at marriage show more percentage of anemia. Most of the cases studied were from rural area around Karad & having agricultural background & most of the women works in the field had various personal habits like eating soil which may facilitate the worm infections that eggs of helminthes may enter along with soil & when get matured cause gasto-intestinal bleeding. In present study it was observed that during ANC visit these pregnant women were provided with antihelmenthic treatment. (ref:5) The other habit was use of smokeless tobacco (masheri) with frequency of 2-3 times a day only 11% cases were observed to be using masheri where as 89% cases had not habit to use masheri, but according to our study results, this criteria did not contribute to the anemia in pregnancy.( Ref:6)

Observed prevalence of anemia may be due to factors like acute blood loss during delivery & chronic blood loss due to various inflammation & infections.

Among 150 pregnant women studied in our region around Karad rural area observed percentage of anemia was 43.4 with more prevalence of moderate anemia in 2nd & 3rd trimester.

Epidemiological determinants studied , regarding to anemia showed :-

Predominantly observed anemic cases were from rural area , age group of 20-25 yrs , Joint family , Lower to middle socio-economic class. (Agricultural economy) , Primary educational level , Multipara , Having mixed diet and House wives etc.

**Conclusion:**

In our area due to the regular ANC visits& proper intake of recommended iron folic acid supplementation throughout pregnancy with antihelminthic treatment, there is lower percentage of anemia as compared to other studies carried out in Maharashtra & other region.

**Bibliography:**

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