Prevalence of iron deficiency and thalassemia in patients presenting Tertiary Care Hospital.

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ABSTRACT... Objectives: To find the frequency of iron deficient anemia and thalassemia in anemic patient reporting in tertiary hospital in Multan. Study Design: Cross Sectional study. Setting: Department of Obstetrics and Gynecology in Nishtar Hospital, Multan. Period: 20th October 2018 to 20th April 2019. Material & Method: In this study total 260 females with anemia HB<10.5g/dl were incorporated. Blood of all the patients were collected following the septic measures in CBC vial for counting of hemoglobin and blood investigation serum ferritin [<11ng/ml] and HB electrophoresis HBA [>6]. Gestational age was predicted depending upon last period of menstruation. Results: Age of patients in this study was between 24 to 34 year with the average age of 29.9±2.3 year, average gestational age 33.2±2.11 week, average parity 1.46±1.3. Iron deficient anemia was observed in 88.4 percent patient. Thalassemia was observed in 5.7 percent patient. Conclusion: The results of our study revealed that iron deficiency and thalassemia are significant contributing factors of anemia in patients reporting tertiary care hospitals Multan. General screening for carriers of thalassemia should be provided to all pregnant females attending prenatal care.

Key words: Anemia, Blood, Haemoglobin, Iron Deficiency, Thalassemia.

INTRODUCTION

In the developing countries, anemia is regarded a general health issue, also it is roughly estimated that about two billion people are suffering from anemia throughout the world. There are varying causes of anemia like deficiency of nutrition, infection and hemoglobin disorder.¹

Anemia can be defined as decrease in the level of Hb in blood which cause to reduce the oxygen carrying capacity of blood. Symptoms of anemia are difficulty in breathing, severe headache, fatigue or angina, in case of severe anemia.²,³ Anemia of iron deficiency [IDA] may be occurred due to deficiency of iron in diet, malabsorption of iron in the intestine, and acute loss of blood.⁴

Thalassemia is defined as the genetic disorder of hemoglobin synthesis due to non-formation of one or more chain of globin.⁵ thalassemia is the worldwide disorder as it is estimated that in the coming 20 years 9 lac individuals are expected to born with thalassemia.⁶ it is visualized that almost 1.5% individuals from world population are carriers of this disease.⁷

It is necessary to distinguish between anemia of iron deficiency and thalassemia to prevent from unusual treatment of iron as in thalassemia patient is restricted to intake of iron.⁸ A proper differential identification between the beta-TT and IDA depends upon results of hemoglobin percentage, serum iron and ferritin concentration. For the determination of red cells as the index of beta-TT, electronic cell counter are used. Use of index to notice subject having higher likelihood to decrease cost of examination.⁹ In the study frequency of iron deficiency anemia was noticed in 20% of patient. Since IDA and thalassemia is usual in prenatal patient, no general study is assessible to examine its frequency in Panjab.

Hemoglobinopathies is commonly genetic disease, almost seven percent of world population
is carrier of this disease, and 3 lack to 5 lack infants are born with acute hemoglobin disease. They are classified depending upon the globin chain and this disease leads to decreased production of normal globin chain or tertiary globin chain. Hemoglobin should have the true structure and managed in appropriate way that alpha chains accurately matches the beta chains.\textsuperscript{10}

Thalassemia refers to hemoglobinopathies identified by completely or partially decreased production of one from two types of peptide chains [alpha or beta chain] caused due to nonsense mutation or missense mutation or frameshift mutation of genes that are controlling the formation of hemoglobin chains. Many types of thalassemia have been reported depending upon genes to be effected to be mutated, most common type of medical importance is beta-thalassemia.\textsuperscript{11} In this we investigate the frequency of iron deficiency anemia and thalassemia in patients presented at tertiary care hospital of Multan, Pakistan.

**MATERIAL & METHODS**

This cross sectional study was conducted in department of obstetrics and gynoecology, Nishtar hospital, Multan from 1\textsuperscript{st} January 2018 to 31\textsuperscript{st} December 2019. Data of 261 patient was collected in order to present the results of the study. Patients from age 24 to 34 having HB level less then 10.5 g/dl with age of gestation 24-34 week were included in study. After taking permission from ethical committee of the hospital, written consent was taken from patient before including data of patient in research. Non probability consecutive sampling technique was used.

Blood of the patient was collected by aseptic measures for counting of hemoglobin and hemoglobin electrophoresis HBA2 [>7]. Gestational age was predicted upon the last menstrual periods. Patients with age less than 24 and greater than 34 were excluded from study.

Data was analyzed by using the SPSS version 23. Mean and S.D was calculated and presented for quantitative variables like gestational age, parity and age of patient. Frequency and percentages were calculated and presented for categorical data like the iron deficiency anemia and thalassemia. P value less than or equal to 0.05 was supposed to be statistically significant.

**RESULTS**

Range of age in this study was from 24 to 34 years, average gestational age 33.2±2.11 week, average parity 1.46±1.3, average gravida was 2.34±1.34 is shown in Table-I. According to economic status of patients three categories were made poor, middle class and rich. 11.5% of patients belong to a poor economic status, 75.5% with middle class and 12.3% with rich Table-II. Thalassemia was diagnosed in 15(5.7%) of patients and and iron deficiency anemia was found in 30(11.5%) of patients.

| Demographic | Mean±SD       |
|-------------|--------------|
| Age of patient | 29.9±2.3 year |
| Gestational age | 33.2±2.11 week |
| Parity       | 1.46±1.3     |
| Gravida      | 2.34±1.34    |

Table-I. Demographic variables

| Socioeconomic Status | No. of Patients | Percentage (%) |
|----------------------|----------------|---------------|
| Poor                 | 30             | 11.5%         |
| Middle class         | 197            | 75.5%         |
| Rich                 | 32             | 12.3%         |
| Total                | 260            | 100%          |

Table-II. Percentage of patients regarding their socioeconomic status

| Thalassemia | No. of Patient | Percentage % |
|-------------|----------------|--------------|
| Yes         | 15             | 5.7%         |
| No          | 245            | 94.2%        |
| Total       | 260            | 100%         |

Iron deficient anemia

| Iron deficient anemia | No. of Patient | Percentage % |
|-----------------------|----------------|--------------|
| Yes                   | 30             | 11.5%        |
| No                    | 230            | 88.4%        |
| Total                 | 260            | 100%         |

Table-III. Percentage and frequency of patients regarding thalassemia

**DISCUSSION**

Among all the populations studied for iron deficient
Iron Deficiency and Thalassemia

anemia and thalassemia syndrome, remarkably beta-thalassemia is highly widespread microcytic hypochromic anemias in all over the world.12,13 Harthoorn Lasthuize et al14 conducted a study on this topic and reported that deficiency of iron is the important provenance of identification interference in laboratory tests for diagnosis of HbA2 that can give positive or negative outcomes.

Steinberg et al15 documented that intracellular deficiency of iron decreases alpha-globin chain manufacturing relatively to that of non alpha-globin chain, when the production of beta chain is decreased, beta globin chain competes in much effective manner for alpha-globin chain than δ-globin chain, that results in decreased level of HbA2.

In a study conducted by Madan et al16 reported that beta-thalassemia doesn’t confer benefit in regulating iron balance, and that HbA2 is not prominently decreased in presence of IDA that was similar with current study.

Steinberg et al17 concluded in his study that increased HbA2 level is established screening test for BTT. But, a few contradictory report questions the authenticity of the tests to screen BTT in existence of iron inadequacy. Negligence to eliminate iron deficiency in the victim with alpha-thalassemia syndrome causes the continuance of supplemental therapy of iron for enlarged duration of time, and in result, overloading of iron can cause secondary hemochromatosis. If overloading of iron continued for about 12—13 years, it can cause harm to many organs of body, includes cardiac, hepatic dysfunction.

Chotnopparatpattara et al18 managed a study on the prevalence and possibility factor of anemia in pregnant women. In our study prevalence of iron deficient anemia was observed in 20% of patient. In a study by Arora S et al19 has observed the frequency of iron deficient anemia was 90.1% and beta-thalassemia was 4.5% in patient. In our study iron deficient anemia was observed in 88% patient and thalassemia was observed in 5.5% patient.

Merrill Rebecca et al20 conducted a study on this topic and concluded that prevalence of thalassemia in rural areas is very high but iron deficiency was found minimum due to intake of iron rich diet. Prevalence of thalassemia was found 28% in this study. In our study thalassemia was found only 5.7% of patients.

CONCLUSION
Screening for carriers of thalassemia carrier should be provided to all pregnant women. Ideally it should early in pregnancy or as soon as possible. Application of simple screening of carrier is possible in Pakistan.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

| Sr. # | Author(s) Full Name | Contribution to the paper | Author(s) Signature |
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| 1     | Nadia Taj           | Conceive idea, Design study. |                     |
| 2     | Saba Javed          | Data collection, Manuscript Writing. |                     |
| 3     | Munazza Munir       | Data collection, Literature review. |                     |
| 4     | Anam Naz            | Data analysis.            |                     |
| 5     | Asma Sajid          | Proof reading.            |                     |
| 6     | Ayesha Karim        | Statistical analysis, Final approval. |                     |