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Iron deficiency anemia among pregnant women

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Introduction

Iron deficiency anemia (IDA) is a condition in which there is low hemoglobin level due to insufficient iron. And it is the most common cause of anemia in overall world. [1]. globally it has affected 3 billion people in which pre-school child has reached at the top (47.4%) and the pregnant women (41.8%) whereas men with the lowest prevalence (12.7%) [2].

Anemia is the one of the major risk factor in pregnancy for both mother and the fetus. Anemia is associated with different conditions like pre-term labor, pre-eclampsia, and maternal sepsis [3]. The WHO defines anemia during pregnancy as a hemoglobin level of less than 11 g/dl or hematocrit level less than 33%, at any point during pregnancy [4].

Anemia has divided into three categories on the basis of its severity: HB concentration less than 7.0 g/dl fall into severe anemia, in moderate anemia there is HB level between 7.0-9.9 g/dl whereas in mild anemia HB level range from 10.0-11.0 g/dl [5] [6]. It has multiple factors including nutritional, genetic, frequent labour, multiparity, abortions and infectious disease, however, iron deficiency is the cause of 75% of anemia cases [7]. Iron deficiency anemia could be due to physiological or pathological causes. In physiologic cause there must increase demand during growth and development however pathological causes link to loss of iron in any chronic condition [8]. Iron deficiency anemia has also directly linked with parity and gravidity. Literature shows that socioeconomic status, BMI, education, maternal Hb, maternal serum ferritin, and low birth weight has no significant association.

A full blood count is taken routinely in pregnancy and may show low hemoglobin, mean cell volume (MCV), mean cell hemoglobin (MCH), and mean cell hemoglobin concentration (MCHC); a blood film may confirm presence of microcytic hypochromic red cells and characteristic ‘pencil cells’ [9].

Iron deficiency anemia arising in pregnancy depends on two reasons: the amount of iron stored at the time of conception and the amount of iron absorbed during gestation. Due to increased demand of iron during pregnancy, most of the women are suffering from IDA. WHO has given the difference of iron deficiency between pregnant and non-pregnant woman which is 32.4% and 44.2% respectively. During pregnancy iron demand increase up to 10-folds, form 6mg/day to 22mg/day in first and third trimester respectively. This increased demand during pregnancy cope up with stored maternal iron that further leads to iron deficiency anemia.

The fact that anemia frequently does arise indicates both that pre-existing stores are often inadequate and that physiological adaptations are insufficient to meet the increased requirements [10]. Both developed and under developed countries are suffering from anemia. Therefore, this study was carried out to determine the prevalence of anemia and true iron deficiency in the pregnant women.

Materials and methods

It was a cross-sectional study. 300 women age rages between 18-40 years were recruited in this study. All healthy pregnant women aged 19-40 years who had Hb level below 11g/dl were recruited for this study. Pregnant women with any acute/chronic illness, hypertension, diabetes, gestational diabetes, obesity and with previous history of blood transfusion were excluded.

The questionnaire was based on socio-demographic data, which includes age, education, and socioeconomic status, past medical history having any complication in previous pregnancy, obstetric history, and blood investigations. The purpose of the study was explained to the participants before the informed consent. The questionnaire was describes into their first language. Data was collected, tabulated and statistically analyzed using IBM SPSS 16.0 where the values of p was considered <0.05

Results

Out of 300 women 230 met the inclusion criteria and participated in this study by filling the questionnaire. Results showed that out of the total, majority of the women were in age group 30-40 years whereas 40% were in age range 18-29 years. 65% women were not educated and 35% had some literacy knowledge. Most of the pregnant women were belonged to lower class where as 87% of them were belonging to middle class and only 13% belonged to upper class.

According to Parity and trimesters

Women were divided into different categories according to their trimesters; almost (45.7%) were in their 3rd trimester of pregnancy whereas (38.2%) in 3rd trimester and only (16.1%) were in their 1st trimester.

Status	No. of participants		%
Pregnancy status	1st trimester	37	16.1%
	2nd trimester	105	45.7%
	3rd trimester	88	38.2%
Parity status	Primigravida	88	19.1%
	Multigravida	44	72.2%
	Grandgravida	166	8.7%
Total participants		230	

Table 1: Status of pregnancy

According to Ferritin level

To calculate the actual number of anemic pregnant women further analysis was done to those women who had hb level less than 11 g/dl. Categories were defined according to the serum ferritin level. So, out of 230 women, 42.6% had ferritin level less than 12 ng/dl and 43.5% had serum level ranging from 12-3 ng/dl while 11.7% were ranging from 31-300 ng/dl whereas rest of 2.2% were lying in last category. High concentration of iron shows significant response to infection.

Category	Serum Ferritin Level	No. of participants	Percentage
Category 1	<12ng/dl	98	42.6%
Category 2	12-3-ng/dl	100	43.5%
Category 3	31-300 ng/dl	27	11.7%
Category 4	>300 ng/dl	5	2.2%

Table 2: Serum ferritin level

According to HB level

Out of 300, 230 women were anemic while rest of them were normal

	HB level	No. of women	%
Patients	<11 g/dl	230	76.7%
Normal	>11 g/dl	70	23.3%
Total		300	100%

Table 3: Prevalence of anaemia

According to severity of Anemia

Anemic people were grouped according to the severity; mild, moderate and severe. In mild category, hemoglobin level was 10.10.9% and no of participants falling in this category was 157. Whereas in moderate category, hb level was 7-20 and 67 participants were in them while rest 6 participants were in severe category having hb level less than 7.

Group	Severity of anemia	Haemoglobin level (g/dl)	No. of participants	Patients %
1	Mild	10-10.9	157	68.3%
2	Moderate	7-10	67	29.1%
3	Severe	Less than 7	6	2.6%

Table 4: Prevalence of anemia based on severity of anemia

Discussion

The most prevalent micro nutrient is iron deficiency combined with anemia in pregnant women with serious health issues. is often associated with other nutritional disorders (particularly folic acid, zinc, vitamin A), and frequently has a secondary cause or association[11] . The prevalence is greater in parous women and in multiple pregnancies. The causes of ID and IDA in the developing world are often different from those in developed countries. Appraisal of iron stores in pregnancy is problematic because of complex physiological changes [12]. Iron deficiency anemia during pregnancy is linked with intrauterine growth retardation, premature birth, low birth weight, increased labor time, higher risk of infection, elevated maternal and prenatal mortality, muscle dysfunction, and low physical capacity. The birth weight is affected by a complex and independent factors in addition to maternal Hb and serum ferritin. The anthropometry of the mother and her nutritional intake are thought to be among the most important [13][14][15]

The most reliable available current diagnostic test for ID is a low serum ferritin. Concentrations <20 µg/L are a very good index of ID. Dietary intake alone to maintain iron stores in pregnancy is unlikely to succeed because of the increased requirements for iron during pregnancy. Oral supplements at a low dose (40 mg elemental iron per day), starting from at least mid-gestation, can ameliorate ID and IDA and improve neonatal outcome and maternal wellbeing, Intermittent oral treatment regimens (weekly or twice weekly) are an alternative therapeutic option, particularly in areas of limited supply or access [13][14]. Over-treatment with iron in pregnancy may be associated with an increased risk of prematurity and infant mortality.

Intravenous iron has a role in the treatment and avoidance of ID and IDA, particularly in women who present late, and/or display severe deficiency or anemia, or who are intolerant of oral iron [15]. It was observed that the etiology of iron deficiency remains the same over the decades. Multiparity, short birth spacing, poor socio economic statuses, lack of education were responsible for high prevalence of IDA. Besides this, it was observed that majority of women attended clinic during the 2nd trimester of pregnancy. So they had lack of iron intake at the time of conception [16] [17] [18]. Non-compliance of iron supplementation was also observed to be an important contributory factor.

Almost all the South Asian countries including Pakistan have national level anemia control programs but this problem still persists. This study will provide a base upon which strategies against the eradication of IDA will be made. Intervention only with iron and folic acid supplements is not adequate to combat this problem but this issue requires a multi-faceted approach. Besides regular screening of hematological parameters during pregnancy, nutritional education and counseling should as a part of anemia eradication plan. Researchers should concentrate on preventive supplements and food fortification approaches.

A detailed health data could be acquired such as parity, menstrual characteristics, infections, previous iron or

blood transfusions, etc. The Government needs to take solid steps to improve the quality of education and socioeconomic status of females, increase the number of health care providers and intensify public education. Health behavior's need to be changed and adherence to the prescribed programs by the government is needed. Providing long term iron supplementation and dietary modification starting from adolescence may improve the hemoglobin levels and later on prevent anemia in pregnancy.

Reference

1. McMahon LP. Iron deficiency in pregnancy. Obstet Med 2010; 3:17–24
2. World Health Organization (WHO). Iron deficiency anemia assessment, prevention and control: a guide for programme managers. Geneva, Switzerland: WHO; 2008. Available at: http://www.who.int/nutrition/topics/ ida/en/print.html. [Last accessed on 2015 Jan 06
3. Sharma JB (2003) Nutritional anaemia during pregnancy in non-industrialized countries. In: Studd J (Edtr), Progress in obstetrics and gynecology. New Delhi: Churchill Livingstone, pp: 103-122.
4. Rockey DC, Cello JP. Evaluation of the gastro-intestinal tract in Patients with iron deficiency anemia. N Engl J Med 1993; 329:1691–1695.
5. Salhan S, Tripathi V, Singh R, Gaikwad HS (2012) Evaluation of hematological parameters in partial exchange and packed cell transfusion in treatment of severe anaemia in pregnancy. Anaemia.
6. Esmat B, Mohammad R, Behnam S (2010) Prevalence of iron deficiency anaemia among Iranian pregnant women, a systematic review and metaanalysis. J Reprod Infertil 11: 17-24
7. Masukume G, Khashan AS, Kenny LC, Baker PN, Nelson G (2015) Risk factors and birth outcomes of anaemia in early pregnancy in a nulliparous cohort. PLoS ONE 10: 1-15.
8. Williams MD, Wheby MS. Anemia in pregnancy. Med Clin North Am 1992; 76:631–647.
9. Breymann C. Iron deficiency and anemia in pregnancy: modern aspects of diagnosis and therapy. Blood Cells Mol Dis 2002; 29:506–516.
10. Nordeng H, Eskild A, Nesheim BI, Aursnes I, Jacobsen G. Guidelines for iron supplementation in pregnancy: compliance among 431 parous Scandinavian women. Eur J Clin Pharmacol2003;59:163–8
11. Zhou SJ, Gibson RA, Crowther CA, Makrides M. Should we lower the dose of iron when treating anaemia in pregnancy? A randomized dose-response trial. Eur J Clin Nutr 2009;63:183–90
12. Bayoumeu F, Subiran-Buisset C, Baka NE, Legagneur H, Monnier-Barbarino P, Laxenaire MC. Iron therapy in iron deficiency anemia in pregnancy: intravenous route versus oral route. Am J Obstet Gynecol 2002;186:518–22
13. Rahmati S., Delpishe A., Azami M., Ahmadi M. R. H., Sayehmiri K. Maternal anemia during pregnancy and infant low birth weight: A systematic review and meta-analysis. *International Journal of Reproductive BioMedicine*. 2017;15(3):125–134. doi:
14. Suryanarayana R., Chandrappa M., Santhuram A., Prathima S., Sheela S. Prospective study on prevalence of anemia of pregnant women and its outcome: A community based study. Journal of Family Medicine and Primary Care. 2017;6(4):739–743. doi: 10.4103/jfmpc.jfmpc_33_17
15. Lin L., Wei Y., Zhu W., et al. Prevalence, risk factors and associated adverse pregnancy outcomes of anaemia in Chinese pregnant women: a multicentre retrospective study. *BMC Pregnancy and*

Childbirth. 2018;18(1) doi: 10.1186/s12884-018-1739-8

16. Smith E. R., Shankar A. H., Wu L. S., et al. Modifiers of the effect of maternal multiple micronutrient supplementation on stillbirth, birth outcomes, and infant mortality: a meta-analysis of individual patient data from 17 randomised trials in low-income and middle-income countries. *The Lancet Global Health*. 2017;5(11):e1090–e1100. doi: 10.1016/S2214-109X(17)30371-6.
17. Bencaiova G, von Mandach U, Zimmermann R. Iron prophylaxis in pregnancy: intravenous route versus oral route. Eur J Obstet Gynecol Reprod Biol 2009;144:135–9
18. Ayub R, Tariq N, Adil MM, Iqbal M, Junaid A, Jaferry T. Efficacy and safety of total dose infusion of low molecular weight iron dextran in the treatment of iron deficiency anemia during pregnancy. J Coll Physicians Surg Pak 2008;18:424–7
19. Solomons NW, Schumann K. Intramuscular administration of iron dextran is inappropriate for treatment of moderate pregnancy anemia, both in intervention research on underprivileged women and in routine prenatal care provided by public health services. Am J Clin Nutr 2004;79:1–3
20. Breymann C, Visca E, Huch R, Huch A. Efficacy and safety of intravenously administered iron sucrose with and without adjuvant recombinant human erythropoietin for the treatment of resistant iron-deficiency anemia during pregnancy. Am J Obstet Gynecol2001;184:662–7
21. Wagstrom E, Akesson A, Van Rooijen M, Larson B, Bremme K. Erythropoietin and intravenous iron therapy in postpartum anaemia. Acta Obstet Gynecol Scand 2007;86:957–62
22. Zhou SJ, Gibson RA, Crowther CA, Baghurst P, Makrides M. Effect of iron supplementation during pregnancy on the intelligence quotient and behavior of children at 4 y of age: long-term follow-up of a randomized controlled trial. Am J Clin Nutr