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The Prevalence of Anemia during Pregnancy among women in Kosti City, White Nile State, Sudan

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Abstract

Anemia is the most common disease in the world, effected young women and children particularly during pregnancy. The aim of this study was to investigate the status of anemia among pregnant women attending to Kosti Teaching Hospital, Kosti City, Sudan. A case-control study was conducted and a total of 100 blood samples were collected. All data were analyzed using Statistical Package for Social Sciences (SPSS version 21). The prevalence of anemia (Hb <11.0g/dl) was 27% among the study group and the majority of women had moderate anemia (55.6%), (mild anemia 14.8 %), and severe anemia was (29.6%). The study observed that there was statistically significance difference in the mean RBCs count, PLT , HGb , MCV, MCH, and MCHC, among anemic group when compared with non-anemic group (P<0.05). There was statistically insignificant difference in measured parameters between normal and anemic women (P. values 0.27, 0.39 and 0.10) respectively. Also there was no significant association between severity of iron deficiency anemia and demographic data (P>0.05). Studying the prevalence rate of anemia among pregnant women may help to improve health status.

Keywords: anemia, pregnancy, Kosti Teaching Hospital - Kosti City - Sudan

1. BACKGROUND

Anemia is the most common disease in the world, effected young women and children particularly during pregnancy. The amount of blood in the body increases by about 20-30 %, which increases the supply of iron and vitamins that the body needs to make

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hemoglobin. Hemoglobin is the protein in red blood cells that carries oxygen to other cells in a body. Several women have lack the sufficient amount of iron needed for the second and third trimesters.

Mild anemia is normal during pregnancy due to an increase in blood volume. However, severe anemia can be higher risk for anemia later in infancy. In addition, significantly anemic during the first and second trimesters, is increasesa riskfor having a pre-term delivery or low-birth-weight baby. Likewise, the mother by increasing the risk of blood loss during labor and making it more difficult to fight infections.

Prevalence of anemia among women in reproductive age as percentage of women ages (15-40) In Sudan 31.5% as reported in 2011 (Stevens et al., 2013). It occurs in all stage of life but the more prevalent in pregnant women and young children. Pregnant women, during lactation and also during premenopausal period are most vulnerable for developing iron deficiency anemia.

Anemia affected 80% of pregnant women. The most at risk are women from low socio-economic groups and teenagers, nutrition plays an essential role in maternal and child health. Maternal age, education level, and antenatal care [ANC]visits were socio-demographic associated with birth weight, and iron supplementation. The goal of this study is to estimate the prevalence of anemia during pregnancy in Kosti City, White Nile State, Sudan.

MATERIAL AND METHODS

Study Design, duration and population

A Case-control study was conducted in Kosti Teaching Hospital, Kosti city, White Nile State, Sudan, during the period from the 1st of June to the 30th of September 2021**.** All

Sampling and processing

A total of 100 venous blood samples (50 blood samples from pregnant women and 50 blood samples from normal women) were collected from each participant in a container coated with EDTA anticoagulants. All samples were analyzed using automated hematological analyzer.

Ethical Consideration

The institutional ethics committee of the Faculty of Medical Laboratory Sciences, White Nile University approved the study. Ethical permission was obtained from the hospital manager. The purpose and objectives of the study were explained to all participants. Written informed consent was obtained from all participants prior to enrolment into the study.

Data analysis

Data was recorded and then analysed using a statistical package of social science (SPSS version 21) program. P values <0.05 were considered significant for all statistical analysis.

4. RESULTS

A case-control study carried out at Kosti Teaching Hospital in White Nile State, Sudan. Demographic data of respondent was collected and age classified into three age group, the more frequent one was 15-25 years 56/100 (56%) followed by age group 26-36years 35/100 (35%). (**Table 1).** Most of women had moderate anemia (60%), with mild anemia (32%) and (29.6%) had severe anemia. The overall prevalence of anemia was 50% as

shown in (**Table 2).** An association of anemic status with demographic variables was statistically insignificant as expressed in **(Table 3)**. The comparison of mean age and hematological parameter between anemic and non-anemic were explained in (**Table 4)**. All variables showed statistically significance difference (P-value <0.05), except in mean of age (P-value =0.256)

Table (1) Distribution of age among studied participants:

Age	Frequency	Percent
15 to 25 years	56	% 56
26 to 36 years	35	% 35
37 to 45 years	9	% 9

Table (2) The overall prevalence rate of anemia and the severity of anemia:

Anemia	Frequency	Percent
Normal	50	% 50
Anemic	50	% 50
Severity		
Mild	16	% 32
Moderate	30	% 60
Severe	4	% 8
Total	50	% 100

Table (3) Association of anemia according to the age among the tow groups:

Variables	Anemia			*P.value*
Age	Normal	Anemic	Total	
15 to 25 years	26	30	56	
26 to 36 years	16	19	35	0.424
37 to 45 years	8	1	9	

Table (4) Differences between demographic data and hematological parameters among the two groups:

Variables	Normal mean+ STD	Anemic(mean+ STD)	*P-value*
Age	26.3+6.6	24.7+5.6	0.256
PLt	310+100	382+129	0.004
WBCs	6.7+2.2	6.3+2.1	0.495
Hb	11.9+1.2	9.4+1.6	0.000
MCV	85.2+5.1	73.6+6.3	0.000
RBCs	4.3+0.38	4.0+0.50	0.002
MCH	27.9+2.7	23.4+3.4	0.000
MCHC	32.8+2.0	29.8+2.2	0.000

DISCUSSION

In this case control study, the women`s age (15-45) were categorize into three different groups. Many studies reported the loss of iron through menstruation; therefore that is why the women in reproductive age need to increase iron intake(0.4-0.5mg/dl/day) [25] . But by using statistic test no significant association found between age group and

occurrence of anemia(P=0.42). Therefore, we confirm [26] that found the different categories of age among women in reproductive age have no effect on anemia.

In the study of etiological factors, no significant relationship was observed between the number of days of menstrual bleeding and occurrence of iron deficiency anemia (P=0.263). This is agreement with the study of [27] in the study amonge women at reproductive age in Saudia Arabia which found that, there was no statistically significant relationship between occurance of anemia and the duration of menstruation day. The risk for iron deficiency increased 6 times in women in reproductive age with 6-7 days of menstruation when compared to women with 3 day of menstruation or less.

The resent study showed that most subjects had moderate iron intake consumption (41%). (2) Subject from women with low iron intake consumption has a severe anemia. And significance statistically difference was found between level of iron intake consumption and iron store status (P=0.01). Other study revealed similar results that female subjects infrequently consuming of red meat and vegetables (Less than two servings of red meat and vegetables per week) were at increased risk of ID&IDA[28].

A longitudinal research for 10 years in the united states is done to find out the effect of heme and nonheme iron intake on body store [29]. No significant association was found between dietary iron and estimated iron store status.

In conclusion, the prevalence rate of iron deficiency anemia poses significant health problem in women of reproductive age in Kosti City (27%). A third of these women are affected by anemia and nearly half of women aged 15-25 are iron deficient. Infrequent or no consumption iron intake was correlated. There are some other factors like heavy menstrual blood loss. Pregnancy and parity levels may account for such an effect. Our current study recommended screening for iron deficiency in high risk groups should be considered, primary physician education is needed to ensure a greater awareness of IDA and the testing needed to establish diagnosis as well as underline causes, implementation of iron fortification is recommended. One approach is to fortify a basic food such as cereals and food made from grain, which are foods consumed in substantial quantities by the most women (15-43 years). Daily protocol of iron supplementation is recommended to prevention and treatment of anemia.

REFERENCES:

1- Garcia-Casal MN, Pasricha SR, Sharma AJ, Peña-Rosas JP. Use and interpretation of hemoglobin concentrations for assessing anemia status in individuals and populations: results from a WHO technical meeting. *Annals of the New York Academy of Sciences*. 2019 Aug; 1450(1):5.

2- Sabina S, Iftequar S, Zaheer Z, Khan MM, Khan S. An overview of anemia in pregnancy. *J Innov Pharm Biol Sci*. 2015;2(2):144-51.

3- Chowdhury S, Rahman M, Moniruddin AB. *Anemia in pregnancy. Medicine Today*. 2014 Dec 25;26(1):49-52.

4- Maats FH, CrowtherCA. Patterns of vitamin, mineral and herbal supplement use prior to and during pregnancy. Australian and New Zealand *Journal of Obstetrics and Gynaecology*. 2002 Oct;42(5):494-6.

5- Banhidy F, Acs N, Puho EH, Czeizel AE. Iron deficiency anemia: pregnancy outcomes with or without iron supplementation. *Nutrition*. 2011 Jan 1;27(1):65-72.

6- Ivan EA, Mangaiarkkarasi A. Evaluation of anaemia in booked antenatal mothers during the last trimester. *Journal of clinical and diagnostic research: JCDR*. 2013 Nov;7(11):2487.

7- Bernardo AK, Gordoncillo NP, Atienza LM, Talavera MT, Recuenco MC. Prevalence and factors associated with folate deficiency among Filipino women of child-bearing age. *Malaysian Journal of Nutrition*. 2020 Aug 1;26(2).

8- Saimin J, Azizah AN, WicaksonoS. Socio-demographic and nutritional determinants of birth weight in coastal areas. *Indonesian Journal of Obstetrics and Gynecology*. 2019 Jan 21:5-8.

9- Bashir M. Pregnancy Outcome in Anemic Pregnant Women: Impact of Dietary Intervention. *Int. J. Nurs. Midwif. Res*. 2018;5(1).

10- Xu X, Liu S, Rao Y, Shi Z, Wang L, Sharma M, Zhao Y. Prevalence and sociodemographic and lifestyle determinants of anemia during pregnancy: a cross-sectional study of pregnant women in China. International journal of environmental research and public health. 2016 Sep;13(9):908.
11-EL Hioui M, Ahami A.O.T1, Aboussaleh Y1,etal. Risk Factors of Anaemia Among Rural School Children in Kenitra, MoroccoEast African Journal of Public Health 2008.
12- Mulugeta Melku , Wubet Worku Takele, Degefaye Zelalem Anlay,etal. Male and undernourished children were at high risk of anemia in Ethiopia: a systematic review and meta-analysis. Italian Journal of Pediatrics 2018; 44:79.
13-Jeffery L. Miller. Iron Deficiency Anemia: ACommon and Curable Disease. Cold Spring Harb Perspect Med 2013.
14-Clara Camaschella, M.D. Iron-Deficiency AnemiaThe New England Journal of Medicine.2015.
15-Dinaz Z. Naigamwalla, Jinelle A. Webb, Urs Giger. Iron deficiency anemia. VOL 53 / 2012.
16-W.BarcelliniandB.Fattizzo. Clinical Applications of Hemolytic Markers in the Differential Diagnosis and Management of Hemolytic Anemia. Disease Markers Volume 2015
17 -Hoffbrand,s Essential Haematology,seventh . Edition 2016.
18-Manish K. Yadav1, Nandini M. Manoli1, SubbaRao V. Madhunapantula, Comparative Assessment of Vitamin-B12, Folic Acid and Homocysteine Levels in Relation to p53 Expression in Megaloblastic AnemiRole of p53 in Megaloblastic Anemia, Role of p53 in Megaloblastic Anemia 2016.
19-Bushra Siddiqui, Divya Rabindranath, Shahbaz Habib Faridi,etal. Megaloblastic anemia: A common but often neglected cause of pyrexia of unknown origin. Journal of translational internal medicine. 2015;3 (2) .
20-Mary louise turgeon . clinial haematology . fifth Edition.2012.
21-Ming V. Lia,b, Weiqin Chenb, Romain N Harmanceyd,etal. Glucose-6-phosphate mediates activation of the carbohydrate responsive binding protein (ChREBP). Biochem Biophys Res Commun. 2010;395(3): 395–400.
22-Paola Bianchi, Elisa Fermo, Cristina Vercellati,etal. Diagnostic power of laboratory tests for hereditary spherocytosis: a comparison study in 150 patients grouped according to molecular and clinical characteristics. Red Cell Disorders. 2012.
23- Chao Wang, Yazhou Cui, Yan Li1, etal A systematic review of hereditary spherocytosis reported in Chinese biomedical journals from 1978 to 2013 and estimation of the prevalence of the disease using a disease model, Advance Publication.2015.
24-Patrick Gand Gallagher M.DAbnormalities of the Erythrocyte Membrane. Pediatr Clin North Am. 2013.
25- Giboney M. J., Margetts, B. M., Kearney, J. M. and Arab, L. Public Health Nutrition. Oxford: Blackwell Science, 2007.
26- Bharati, P., Som.S. Chakrabarty, S., and Pal., M. Prevalance of anemia and determination among non-pregnant women in India, As Pac Pub, 2008;20:347.
27-Fatin A., Mamdooh G., Safaa Q., Nadiah B., and Adel A. Prevalence of iron deficiency anemia among female at university stage. *JMLD, 2011;2(11)*:PP.5-11.
28- AL-Quaiz, J.M. Iron Deficiency Anemia: A study Of Risk Factors. *Saudi Med J, 2001;22(6)*:490-496.
29- Garry P. J. Hunt W. C and Baumgartner R.N. Effects Of Iron Intake on Iron Store in Eldery Men and Women: Longitudinal and cross-sectional Result. *J AM Coll Nutr, 2000;19*:262-9.