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Risk Factors of Anemia Among Child Bearing Women

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ABSTRACT

Background: Anemia is a common health problem influencing both developing and developed countries with major outcome for human health as well as social and economic development.

Aim : the present study aimed to identify the risk factors of anemia in child bearing women visiting family medicine centers in Mosul City.

Patients and Methods : The study was done at the family medicine centers in Mosul City , Nineveh Health Directorate. Using case- control study design for a period of three months extending from 1st March to 1st June 2017. One hundred sixty five women of childbearing age(15-49 years) and their hemoglobin was <12gm/dl was considered as cases, and 165 women of childbearing age(15-49years) and their hemoglobin level >12gm/dl was considered as controls .A special questionnaire formula has been prepared for collecting data from both cases and controls.

Results : the result of this study was significant association of drinking juices containing vitamin C in preventing anemia(p= 0.03). Clots with menstruation had high significant association (p= 0.001). High parity had significant association (p= 0.02) with about 2 folds increase probability of anemia in cases than controls. There was strong association between history of hemorrhoid, history of previous anemia, and family history of anemia (p= 0.01),in contrast past medical history ,past surgical history, parasitic infestation, ingestion of drugs like NSAID ,and antacid had high odds ratio but without significant association.

Conclusions : The conclusion is that there is significant association of drinking juices containing vitamin C , clots with menstruation ,and high parity with anemia ,in addition to some medical diseases(hemorrhoid, history of previous anemia, and family history of anemia),with anemia .

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Introduction

Anemia is the condition of having lower than normal red blood cell or quantity of hemoglobine with diminshes the capacity of the blood to carry oxigen .

Anemia is a major health problem influencing both developing and developed countries. In 2002 iron deficiency anemia(IDA) was considered to be among the most important contributing factor to the global effect of the disease and considered nowadays the world common prevalent nutritional problem ,and one of the most common cause is nutritional problem like decrease meat consumption (1,2).

The hemoglobin cutoff point defining the condition are age and sex dependent. In adult female the cutoff point is 12gm/dl ,but in pregnant it is 11gm/dl (3).

One in four persons affected by anemia globally, women in child bearing age, pregnant women and young children having greater risk and are especially susceptible to IDA because of blood loss from menstruation and the increased blood supply demands during pregnancy (4).Worldwide(the prevalence of anemia in women of child bearing age) is 30.2% (5).

Iron deficiency anemia(IDA) is probably the most common reason of anemia ,the recommended daily allowance of iron is 10mg daily for male gender and 15mg daily for female (6.(

Non heam iron is mainly derived from cereals .heam iron is derived from hemoglobine and myoglobine in red or organ meat .heam iron is better absorbed than non heam iron.

The factor infleuncing iron absorption include :gastic acidity helps to keep iron in the ferrous state ,formation of insoluble complexes with phytate or phosphate ,and iron absorption is increased with low iron stores and in hemolysis and bleeding.

The etiology of IDA are :blood loss,increase demand such as growth and pregnancy ,decreased absorption ,and poor intake . Blood loss e.g. menorrhagia and gastrointestinal bleeding ,poverty may cause IDA, malabsorption e.g. celiac disease ,and hook worm infestation (7). Other risk factors in female are having >3 children and having a child <24 months old and more important factors include poverty and illiteracy(8 .(

Also anemia is related with chronic blood disease like thalassemia .Some drug consumption may cause anemia like aspirine and iboprofen.

Diagnosis of IDA deped on detailed history taking :fatigue ,dyspnea ,faintness ,palpitation ,headache ,tennitus ,anorexia and angina . Clinical features of IDA include :

paller, tachycardia, systolic flow murmur , brittle nail ,spoon shaped nails (koilonychia),atrophy of the papillae of the tongue ,angular stomatites ,brittle hair and asyndrome of dysphagia and glossitis .Investigation hemoglobine level to diagnose anemia,then mean cell volume (MCV) to diagnnose type of anemia.

*low MCV(microcytic anemia(
*normal MCV(normocytic anemia(
*high MCV(macocytic anemia(

The most common cause of microcytic anemia is IDA , to diagnose IDA serum ferritine done ,total iron binding capacity ,bone marrow.

Treatment of IDA :treat the cuase oral iron ferrous sulphate 200mg SE : nausia ,abdominal discomfort,diarrhea or constipation ,black stool, Hb should rise 1gm per week ,injectable iron not needed until gastrointestinal disability

Continue oral iron until Hb return normal ,and for another 3 months for the stores .

Aim of the current research is to detect the risky factors of anemia in child bearing women attending family medicine centers in Mosul City and prophylactic measures related to management.

Patients and Methods

Administrative and ethical consideration

Prior to data collection ,ethical consideration, and essential official permissions were obtained from Nineveh Health Directorate.

Study setting

The study was done at the family medicine centers (Al- quds, Al- araby, Al- hadbaa Family Medicine Centers) in Mosul City , Nineveh Health Directorate.

Study design; Case- control study .

Study period

The study has been conducted during three months duration (1st March to 1st June 2013.(

Study sample

To achieve the aim of the present study 165 women of childbearing age(15-49 years) and their hemoglobin was <12 gm/dl were included as cases ,group A,(depending on WHO criteria), and 165 women of childbearing age(15-49 years) and their hemoglobin level >12 gm/dl were included as controls,group B, . Breast fed mothers ,pregnant women ,women in purperium, and menopausal women were not included in the study.

Data collection tool

A questionnaire form was used to collect information about patients' character, diet, obstetrical, medical history (13) . The data gathered were depend on self-reported data. Laboratory investigation was done include Hb and PCV.

Statistical analysis

The information regarding each participant was transferred into a code sheet and data entry was done using computer Pentium IV. Statistical analysis was done using SPSS package version (11).Chi –square test ,odds ratio (OR) and 95% CI were used .p - value at a level < 0.05 was considered significant .Data were presented in suitable tables .Percentages were calculated for the various group variables .

Results

330female were included in the study ,165 patient have anemia and 165 not have anemia.

Table 1 reveals demographic criteria of female with anemia and and those without anemia. most of female were between 20-27 years and 28-35 years age group. The largest number of women were married , and house-wives (73% and 76%) respectively.

Also, majority of women lived in urban places, there is no differences were shown between demographic characteristics of cases and controls.

Table (1): Socio-demographic characteristics of cases and controls

Characteristics	Cases (N= 165)		Controls (N=165)		OR	p-value*
	No.	%	No.	%		
Age						
< 20	22	13.3	19	11.5	1.18	**0.62**
20-27	54	32.7	49	29.7	1.15	**0.55**
28-35	52	31.5	52	31.5	1.00	**1.00**
> 35	37	22.5	45	27.3	0.77	**0.31**
Marital Status						
Single	37	22.5	36	21.8	1.03	**0.89**
Married	122	73.9	120	72.7	1.06	**0.80**
Divorced	2	1.2	7	4.3	0.27	**0.09**
Widow	4	2.4	2	1.2	2.02	**0.41**
Education						
Illiterate	17	10.3	19	11.5	0.88	**0.72**
Elementary	63	38.2	54	32.7	1.72	**0.30**
Intermediate	34	20.6	38	23.0	0.86	**0.59**
Secondary	22	13.3	18	11.0	1.25	**0.50**
University	29	17.6	36	21.8	0.76	**0.33**
Occupation						
Housewife	126	76.3	110	66.7	1.61	**0.05**
Employed	39	23.7	55	33.3	0.62	**0.10**

Geographical location						
Urban	142	86.0	140	85.0	1.10	**0.75**
Suburban	23	14.0	25	15.0	0.90	
Housing						
Owned	121	73.3	130	78.8	0.74	**0.25**
Rented	44	26.7	35	21.2	1.35	

*x^2-test was used.

Table 2 show determination of anemic patient according to diet, 55% of the anemic patient show history of little meat meat eating compared to 48% of control group. infrequent consumption of vegetables was reported in 29% of cases compared to 23% of controls.

There was significant association of drinking juices containing vitamin C in preventing anemia(p = 0.03), in contrast ,no significant association between cases and controls relating to consumption tea, coca, yogurt after lunch, and also following a dietary regime.

Table (2): demonstrate women with anemia and those without anemia regarding dietary habits.

Characteristics	Cases (n=165)		Controls (n=165)		OR	p-value*
	No.	%	No.	%		
Eating Meat						
Frequent	74	44.8	85	51.5	0.76	**0.23**
Infrequent.	91	55.2	80	48.5		
Eating Vegetables						
Frequent	117	71.0	126	76.3	0.75	**0.26**
Infrequent	48	29.0	39	23.7		
Drinking Coffee/tea						
Frequent	65	39.4	65	39.4	1.00	**1.00**
Infrequent	100	60.6	100	60.6		
Drinking yogurt **with lunch**						
Frequent	52	31.5	49	29.7	1.09	**0.72**
Infrequent.	113	68.5	116	70.3		
Drinking Coca						
Frequent	65	39.4	60	36.4	1.14	**0.57**
Infrequent	100	60.6	105	63.6		
Drinking Vitamin C containing juices						
Frequent	45	27.3	64	38.7	0.60	**0.03***
Infrequent	120	72.7	101	61.3		
Following Dietary Regime						
Frequent	42	25.5	43	26.0	0.97	**0.90**
Infrequent.	123	74.5	122	74.0		

*x2-test was used.

Table 3 shows frequency of female with anemia regarding gynecological history,32 % of cases had clots with menstruation compared to 16% of controls(p= 0.001) with about 2.5 times

greater risk of having anemia in women with clots formation during menstruation than controls.

Table(3): shows freqeuncy of female with anemia regarding gynecological history

Characteristics	Cases (n=165)		Controls (165)		OR	p-value*
	No.	%	No.	%		
Frequency of Period						
Once / month	141	85.4	146	88.5	0.76	**0.41**
More / month	24	14.6	19	11.5		
Duration of period in days						
≥ 8 days	30	18.2	23	13.9	1.37	**0.29**
≤ 7 days	135	81.8	142	86.1		
Clots with period						
Clots	53	32.1	27	16.4	2.41	**0.001****
No Clots	112	67.9	138	83.6		
Use of the Oral Contraceptive pills						
present	37	28.9	43	33.8	0.79	**0.39**
absent	91	71.1	84	66.2		
Use of Intra Uterine Contraceptive Device						
present	35	27.3	35	27.5	0.99	**0.97**
absent	93	72.7	92	72.5		

*x2-test was used.

Table 4 reveals frequency of women with anemia regarding obstetric history . There were no significant association shown between female with anemia and those without anemia regarding birth interval, or taking iron supplements, only high parity was significant (p = 0.02) , with about 2 folds increase risk of anemia in cases than controls.

Table 4 reveals frequency of women with anemia regarding obstetric history

Characteristics	Cases (n=128)*		Controls (n=127)*		OR	p-value**
	No.	%	No.	%		
Parity(did you have children)						
Yes	119	92.9	120	94.5	0.77	**0.62**
No	9	7.1	7	5.5		
No. Children						
≥ 5	49	38.3	31	24.4	1.92	**0.02***
< 5	79	61.7	96	75.6		
Birth interval in years						
≤ 2	49	38.3	44	34.6	1.17	**0.55**

> 2	79	61.7	83	65.4		
Iron supplements during pregnancy						
present	95	74.2	105	82.6	0.60	**0.10**
absent	33	25.8	22	17.4		
Iron supplements after delivery						
present	63	49.2	64	50.4	0.95	**0.85**
absent	65	50.8	63	49.6		

*unmarried women were excluded from cases (n=37) and controls (n= 38) .

**x2-test was used.

Table 5 reveals no. of patient with anemia and controls regarding medical history, there was strong association between history of hemorrhoid, history of previous anemia, and family history of anemia(p= 0.01). In contrast past medical history ,past surgical history, parasitic infestation, ingestion of drugs like NSAID ,and antacid were not significant.

Table (5): reveals no. of patient with anemia and controls regarding medical history

Characteristics	Cases (n=165)		Controls (n=165)		OR	p-value*
	No.	%	No.	%		
Past medical Diseases						
present	**36**	**21.8**	**36**	**21.8**	**1.00**	**1.00**
absent	**129**	**78.2**	**129**	**78.2**		
Parasite infections						
present	**19**	**11.5**	**14**	**8.5**	**1.40**	**0.36**
absent	**146**	**88.5**	**151**	**91.5**		
Hemorrhoids						
present	**36**	**21.8**	**20**	**12.1**	**2.02**	**0.02***
absent	**129**	**78.2**	**145**	**87.9**		
Blood Disorders						
present	**10**	**6.0**	**13**	**7.9**	**0.75**	**0.52**
absent	**155**	**94.0**	**152**	**92.1**		
History of IDA						
present	**74**	**44.9**	**45**	**27.3**	**2.17**	**0.001****
absent	**91**	**55.1**	**120**	**72.7**		
Antacid						
present	**34**	**28.5**	**28**	**16.9**	**1.28**	**0.31**
absent	**109**	**71.5**	**137**	**83.1**		
NSAID						
present	**48**	**29.1**	**39**	**23.6**	**1.32**	**0.26**
absent	**117**	**70.9**	**126**	**76.4**		
Family History of IDA						
present	**74**	**44.8**	**50**	**30.3**	**1.87**	**0.006****
absent	**91**	**55.2**	**115**	**69.7**		
History of Operation						
present	**68**	**41.2**	**53**	**32.1**	**1.48**	**0.09**
absent	**97**	**58.8**	**112**	**67.9**		

*x2-test was used.

Discussion:

Despite global recognition ,IDA is still the main health problem especially in developing countries .The prevalence seem to be increasing (8).Iron deficiency anemia is the most common and primary cause of anemia (9)

Sociodemographic data having a role to increase the probability of IDA and the more important factors are :marital status ,illiteracy, and poverty (8).The present study showed that most of women were married and housewives (73% versus 76%). But there is no significant difference shown between demography features of patients and controls ,and this result is consistent with the result obtained by study done in Saudia Arabia by Al-Quaiz(10).

Diet such as little eating of meat ,dark green vegetables',and fruits have been known to be related with iron dificiency anemia (10). iron from red meat gives 10-20% of iron need while non haem iron (from green vegetables,and cereals)gives 80-90%. Absorption of iron is influenced by status of iron in each person .vitamin C is known as a strong enhancer of iron absorption from non heam foods when consumed within a meal .The Important iron absorption inhibiters are: tea ,coffee ,cocca ,soy protein ,high dose of minerals ,bran ,and fiber (10,11,12)

An interesting finding in the present study is that drinking vitamin C containing juices is protective factor for anemia (P = 0.03),and this result is consistent with the result of a study done by Al- Quaiz(10). No significant difference have been founded in the present study regarding eating meat ,eating vegetables ,drinking coca ,following dietary regime .And this result agree with the study done in Saudia Arabia by Alsays et al.(13) ,except eating meat in the study of Saudia Arabia which demonstrate significant difference (p= 0.02).This could be due to consumption of tea and coffee after meal is a popular habit in Mosul and Saudia ,and to get a significant difference between cases and controls a bigger sample size is needed**.** Menorrhagia is risky factor for iron dificiency anemia among female of child bearing age (14).The current study suggested that history of menorrhagia with clots increases the risk of anemia(p= 0.001). This result agree with the study done in Quetta Valley in 2011,which consider heavy menses with clots is 9%risky to get anemia (14).On opposite side taking oral contraceptive pills and use of intrauterine contraceptive device positively associated with high risk of anemia (10),but the current study did not detect such association could be due to small number of patients using pills or intrauterine contraceptive device**.**

It should be born in mind that high parity with short birth intervals resulting in wasting and depletion of

calories in child bearing women ,which may result in anemia (15). The present study found that increase parity had a significant association (p= 0.02) with about 2 fold increase probability of anemia .This result is consistent with the result of a study done by Mahmood et al.(14).It is also agree with the study done in Pakistan in 2009(8) and a study done in Iran in 2000 (15)

A significant association between parasitic infestation and IDA is usually present (8), but the present study did not found such association ,which may be due to small sample size .In contrast a study done in Quetta Valley in 2012 showed that hook worm infection increase risk of anemia 8% (14).

Chronic medical diseases that are mentioned in the literature to be risk factors for IDA are :history of hemorrhoid, blood diseases ,history of IDA ,and family history of IDA (13,14,16) .The current study showed significant association with these factors with about 2-3 folds increase risk of anemia, and this agree with the result obtained by the study done in Quetta Valley in 2012 (14). But Saudia Arabia study in 2010 reported no significant association regarding blood diseases and history of IDA mainly due to their smaller sample size (13**.(**

Among the important causes of IDA are non steroidal anti inflammatory drugs, they may cause gastrointestinal hemorrhage which as a lead to anemia .Drugs like antacids may decrease absorption of iron (13,14,16). In contrast the reports in the current study showed no significant relation with the use of these drugs ,this may be due to small sample size of patients using these drugs in the present study .This finding is consistent with the result demonstrated by Alsays et al. in 2010 (13).

Conclusions **:**

The conclusion of this study is that there is significant association of dietary habits ,menorrhagia with clots ,and high parity >5 children with anemia . Also some medical diseases have significant association including : history of hemorrhoid ,history of IDA ,and family history of IDA . Use of NSAID and antacids exhibited high odds ratio but without significant association **.**

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