Assessment of Antenatal Care Services regarding Iron deficiency anemia during pregnancy In Sudan - 2010

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Abstract:

Background: Pregnancy is a crucial time to promote health thus good antenatal care can promote mother and new born health &links mother with formal health system with increasing chance of using a skilled attendant at birth while inadequate care during this time increases mortality & morbidity of mother & new born.

Objectives: Assessment of Antenatal Care Services in relation with Iron deficiency anemia during pregnancy.

Patients and Methods; A descriptive study was carried out in 12 health centers , which were chosen randomly in Behri area (part of Khartoum City) in Sudan that (300) available pregnant females in 3rd trimester were interviewed (using non probability convenience sampling) by using a questionnaire paper during the period between September– December2010.

Results; The study revealed that most of females were educated & all of their husbands were educated, more than half of them were over thirty & 22% below fifteen , about quarter of them had history of previous abortion & had complications mostly hypertension .The prevalence of anemia was 60% , 40% had mild anemia (mean hemoglobin & S.D 10.18, ±0.51), C.I (10.58 –9.79) , p value <0.05) & 20% had moderate anemia with mean hemoglobin & S.D 7.63 , ± 0.12) ,C.I (7.64- 7.61), p value <0.05). Regarding antenatal care services less than half had taken ferrofole tablet for once & 20% for twice/ day with significant association, P value = 0.001. All of them attended antenatal care centers in the 2nd trimester and mostly for less than 4 visits that mostly affected by education, occupation of females with significance association ,P value = 0.001 , 0.01 respectively & also affected by education of husbands with significant association , P value = 0.001.Regarding dietary pattern most of them had poor intake of white meat , had good intake of carbohydrate unless rice & macaroni . For vegetables more than half had poor intake of green pepper, green leaves, spinach, chard & all of them had poor intake of grape.

Conclusion; More than half of respondents were anemic ,with high risk pregnancy &still had insufficient coverage & inadequate utilization of antenatal care services which mostly affected by maternal education & occupation , husband's education & availability with poor spacing between last child & another which affected by parity while for dietary pattern there was average & poor intake of food that rich with iron .

Key word; Antenatal care services, anemia during pregnancy, risk pregnancy, dietary pattern.

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Introduction;

Antenatal care is a type of preventive health care with the goal of providing regular check-ups that allow doctors to treat and prevent potential health problems throughout the course of the pregnancy while promoting healthy lifestyles that benefit both mother and child.(1,2) For women whose pregnancies are progressing normally, World Health Organization recommends a minimum of four Antenatal care visits, ideally at 16 weeks, 24-28 weeks, 32 weeks and 36 weeks . (3) The first visit which is expected to screen and treat anemia, syphilis, screen for risk factors and medical conditions that can be best dealt with in early pregnancy and initiate prophylaxis for anemia and malaria is to be held if it´s needed by the end of fourth month. (4) Each visit should include care that is appropriate to the overall condition and stage of pregnancy and should include main categories of care by identification of pre-existing health conditions as check for weight, nutrition status, anemia, hypertension, syphilis, HIV status, then should detect of complications arising during pregnancy as check for pre- eclampsia, gestational diabetes. 3rd categories is health promotion and disease prevention as tetanus vaccine, prevention and treatment of malaria, nutrition counseling, micronutrient supplements, family planning counseling. The last category is to prepare for birth and complication planning as birth and emergency plan, breastfeeding counseling, anti retro virus for HIV positive women and reducing mother-to- child transmission .(3,5) Recent reports from the World Health Organization and the Institute for Health Metrics and Evaluation estimate that approximately 800 women die from preventable causes related to pregnancy and childbirth every day, with 99% of

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these maternal deaths taking place in developing countries (6). Regarding anemia it is defined by the World Health Organization as hemoglobin levels of ≤ 11 g/dl is one of the world's leading causes of disability (7), and thus one of the most serious global public health problems. The prevalence of anemia in pregnancy varies considerably because of differences in socioeconomic conditions, lifestyles and health-seeking behaviors across different cultures. Anemia affects nearly half of all pregnant women in the world: 52% in developing countries compared with 23% in the developed world .(7) The most common causes of anemia are poor nutrition, deficiencies of iron and other micronutrients .(8) During pregnancy should provide educational sessions about Proper hygiene , important of breast feeding ,family planning , proper habits as decrease drinking of tea ,coffee & stop smoking, with good nutrition during pregnancy that needs 300 k.cal as extra energy & 1.4g/kg of protein with 50% increase of vegetables & fruit & intake of 6-8 cups of water with 4 cups of milk & avoid smoking &should intake drugs under supervision of doctor .(9) The factors affecting antenatal care intake were maternal education, husband's education, marital status, availability, cost, household income, women's employment, media exposure and having a history of obstetric complications .(10)

Patients and Methods:

A descriptive study was carried out in (12) Health centers that had been chosen randomly in Behri area –(part of Khartoum City) . Three hundred pregnant females in the 3rd trimester were interviewed to assess antenatal Care Coverage &Utilization in relation with Iron deficiency anemia during pregnancy (convenience non probability sampling) in (AL-Kababeth, AL-Khatmia, AL-Kaose, AL-Shaheed Khalid, Salamnia , Halfaya ,Widnobawi ,Hay AL-Sohoor , AL-Dao-Hajoj ,AL-Shaibeya , AL-Shambat ,AL-Safia) health centers during the period between September – December, 2010 . The sample size was representing according to the prevalence of anemia during pregnancy that formed 57,7% in Sudan (11) with using confidence level of 95% & equation of sample size ; $(0.05)^2$

That the sample size of pregnant females should be 192 & could be reached to 300. A questioner was designed that contents;

1. Demographical &social characteristics that include age of females, education and job status of females & their husbands
2. Obstetrical history as: gravidity, parity, abortion.
3. Risk pregnancy as : history of diseases , history of complications.
4. Anemia was estimated by measuring of hemoglobin & PCV while Malaria was estimated by using of thick blood film.
5. Habits as; drug addicts & smoking cigarette, tea drinking.
6. Dietary pattern of the food was rated according to the frequency distribution table & only the items of food that rich with iron were selected as the following;

* Dividing the food items according to their groups & the items that were rich with iron had chosen as red meat white meat , liver & fish from meat group , milk group, egg , legume groups as lentils & fava then dietary pattern traditional & ordinary seed food in Sudan as kasra, kaurasa (kind of weight bread), aseeda (kind of corn soap) , rice & macaroni. For vegetable groups tomato, green pepper, parsley & green leaves, spinach & chard had been chosen while for fruit group apple, banana, mango, grape, guava, dates had been chosen.

Considering a good dietary pattern when there was daily intake or more than 4 times / week for each food item , an average dietary pattern when there was 2-3 times / week intake of food item while considered poor dietary pattern when intake of food item was less than 2 time / week .(9).

*** Statistical Applications :** Statistical tests were applied for measuring of ungrouped mean that the equation

$$S.D = \frac{\sqrt{\sum(X - \bar{X})^2}}{\sqrt{(N-1)}},$$

with -Calculating of confidence Interval at 95% confidence level by using the equation

C. I = X"± P (c.f) (s/(√(n) ,

C. I of 95% = X"± 1.96 x (s/(√(n) .

Application of X^2 Test by using 2 X 2 table, calculate degree of freedom = (raw - 1) X (Colum - 1)

$$X^2 = \sum \frac{[0 - E]^2}{E}$$

Results;

Table (1) Socio demographic characteristics showed that 90% were educated as 30% with primary school , secondary school & graduation respectively ,30% were working as 10% workers , 20% clerks for their husbands all of them were educated as 20% with primary school, 30% with secondary school &50% graduation.

Table1; Distribution of Social Status of Females

Age	<15yrs No.	%	15-30 yrs No.	%	>30yrs No.	%	Total No.	%
	66	22%	90	30%	144	48%	300	100%
Education								
Education of Females	Illiterate No.	%	Primary No.	%	Secondary No.	%	Graduation No.	%	Total No.	%
	30	10%	90	30%	90	30%	90	30%	300	100%
Occupation of females	House wife No.	%	Worker No.	%	Clerk No.	%	Total No.	%
	210	70%	30	10%	60	20%	100%	300

Table (2) Assessment of risk pregnancy, showed that 60% was at risk as 22% were below 15years & 48%were above 30 years, 20% of them had previous abortion & 55% were grant multipart's, 10% with twin pregnancy, 20% had complications as 10% had preeclampsia & 5% had bleeding during pregnancy & 5% had urinary tract infection while 10% suffered from diseases as diabetes mellitus formed 6%, heart disease & asthma formed respectively.

Table 2; Assessment of risk pregnancy

Age	<15yrs No.	%	15-30 yrs No.	%	>30yrs No.	%	Total
	66	22%	90	30%	144	48%	100%
	Yes				No		
Abortion	60		20%		240	80%	100%
Grant multi para	165		55%		135	45%	100%
Twin pregnancy	Yes				No		
	30		10%		270	90%	100%
	Yes				No		Total
Complications	Hypertension No.	%	Bleeding No.	%	infection No.	%	Total No.	%	No.	%	
	30	10%	15	5%	15	5%	60	20%	240	80%	300 100%
Other diseases	Yes						No		
	D.M		H T		Asthma		Total %		270	90%	100%
	18	6%	6	2%	6	2%	10%				
Smoking	60		20%		No. 240		% 80%		Total 100%		

The prevalence of anemia was 60% , 40% had mild anemia (mean & S.D of hemoglobin =0.18 ± 0.51, C.I = (10.58 –9.79) p value <0.05) & 20% had moderate anemia (mean & S.D of hemoglobin = 7.63 ± 0.12 , C.I = (7.64 – 7.61), p value <0.05) while 5% had malaria infection.

For habits 20% were smoking cigarette less than10 times /day & there was no intake of alcohol or drugs , about 70% were drinking tea frequently & directly after meal . Regarding antenatal care services, there was routine checking of blood pressure for all females while no regular follow up for weight or routine investigations for anemia, sexual transmitted diseases and malaria infection while in this study there were 5% of pregnant females had malaria.

Table (3) Interventions showed that 40% had routine intake of ferrofole tablet once / day & 20% twice / day with significant association between anemia & intake of ferrofole , P value = 0.001.There was routine intake of tetanus vaccine that 60% had taken it once & 40% twice while no routine of giving prophylactic drugs as chloroquine or calcium tablets.

Table 3; Distribution of Anemia & intake of ferrofole tablets

ferrofole tablet	Anemia +v	Anemia –v	Total	%
No tablet	80	40	120	40%
1 tablet	70	50	120	40%
2 tablet	20	40	60	20%
Total	170	130	300	100%

X^2 = 18.32, df=2 , P Value =0.001

For education during pregnancy, there were no educational sessions about proper hygiene, important of breast feeding & family planning that 70% was without spacing between last child & another .

Table (4) Association between Education of pregnant females & there husband´s , working of pregnant females with times of visits showed that all females had attended antenatal care centers in the 2nd trimester and never covered (7) visits and 60% had attended less than 4 visits which mostly was affected by education & occupation of females & both were statistically significant association , P value = 0.001 , 0.01 respectively , also attendance were affected by education of husbands with statistically significance association , P value = 0.001.

Table 4 : Association between Education of pregnant females & there husband´s , working of pregnant females with times of visits

Education	Visits					
Education of pregnant females	4 < visits No.	%	> 4 visits No.	%	Total No.	%
Illiterate	50	27.8	10	5.6	60	20%
Primary	70	38.9	20	11.1	90	30%
Secondary	40	22.2	30	16.7	70	23.3
Graduation	20	11.1	60	33.3	80	26.7
Total	180	60%	120	40%	300	100%
X^2	df		P value			
43.93	3		0.001			
Education of husbands	4 < visits No.	%	> 4 visits No.	%	Total No.	%
Primary	50	33.3%	50	33.3%	100	33.3%
Secondary	60	40%	40	26.7	100	33.3%
Graduation	40	26.7	60	40%	100	33.3%
Total	150	100%	150		300	100%
X^2	df		P value			
8	2		0.01			
Working of pregnant females	4 < visits No.	%	4 > visits No.	%	Total No.	%
House wife	50	45.5	20	10.5%	70	23.3
Worker	20	18.2	10	5.3%	30	10%
Clerk	40	36.3	160	84.2%	200	66.7
Total	110	100%	190		300	100%
X^2	df		P value			
105.43	2		0.001			

Figure (1) Dietary pattern of meat group showed that 50% had average intake of red meat, 40% had average intake of poultry , 80% had poor intake of fish & bovine , lamp organs meat (liver ,brain , spleen----).

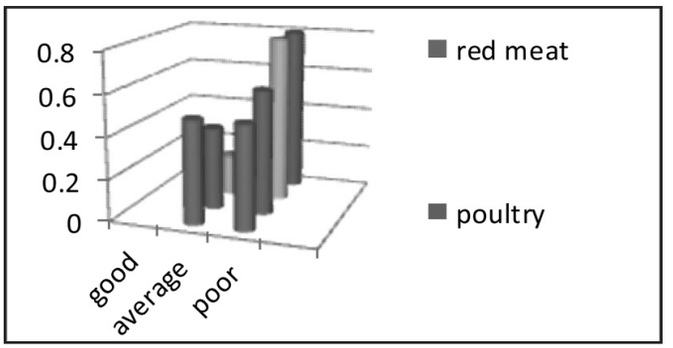

Figure 1 ; Dietary pattern of meat group

Figure (2) Dietary pattern of milk group showed that 20% had good intake, 30% had average intake of milk, for cheese & yogurt 50% had average intake & 50% had poor intake respectively.

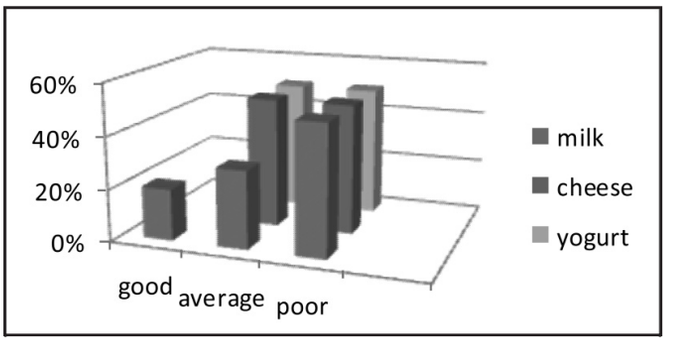

Figure 2; Dietary pattern of milk group

Figure (3) Dietary pattern of traditional & ordinary seed food showed that 70% had good intake of kasra , kaurasa &less for aseeda that 50% had good intake while for rice & macaroni 70% had poor intake.

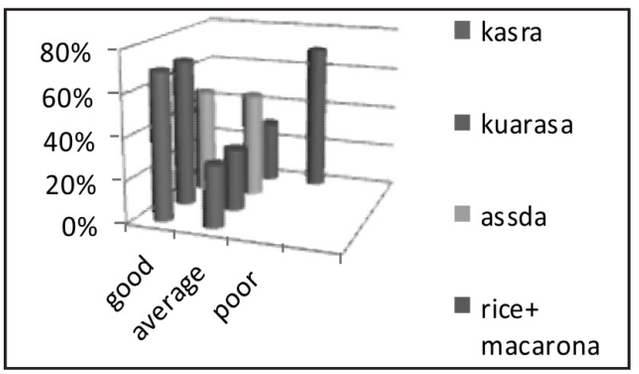

Figure 3; Dietary pattern of traditional & ordinary seed food

- For dietary pattern of legumes 100% of them had good intake of fava &50% of lentils .

-For vegetables, 60% had average intake of tomato in contrast that 60% had poor intake of green pepper , parsley & green leaves & 100% with poor intake of spinach & chard .

Figure (4) Dietary pattern for fruit showed that 60% had average intake of banana, 30% had average intake of apple, for dates 50% had average intake &40% had average intake of mango & guava while 100% had poor intake of apricot & grape .

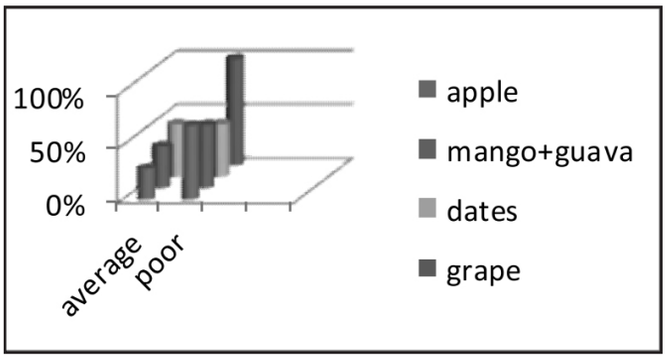

Figure 4 ; dietary pattern of fruit group

-About place of delivery 50% were decided to deliver at home &50% at health departments.

Discussion;

The study revealed that most of studied females were educated & house wives and all of their husbands were educated .More than half of them were at risk age &grant multipara , a multiparty in our population is much higher than in other countries that forms 86% while in United States in 2010, nearly 190,000 women gave for fifth birth , multipart increased the risk of pregnancy complications(13) . Small proportion of females had twin pregnancy, complications & diseases as hypertension &diabetes mellitus, also part of them were smoking cigarette. High-risk pregnancies form about 6-8% that need medical specializing in maternal-fetal medicine (14).

- Regarding anemia more than half of them were anemic that less concentration of hemoglobin during pregnancy is resulting in physiological anemia which affects 50% of pregnant women in the world (2) , (3) , (10) . By report of World Health Organization in 2006 found that 57,7% of pregnant females were anemic in Sudan (11) &50 % in Bangladesh while another studies found the prevalence was 84.4% in Uganda& 70% in Tibet (15) , (16) but decreased to 5.2% in Saudi Arabia (16) . In this study 5% of females had infection with Malaria while in another studies as in Khartoum the prevalence was 26.2% (17) &19.7% in Nigeria (18) while in Al hudiada city the prevalence decreased to 6.2% (19), even so there was no reports about malaria & hematocrit testing or preventive drug for malaria infection while in Entab hospital preventive measures for malaria was (66%) (20).

- Regarding antenatal care services; All of them attended antenatal care centers in the 2nd trimester , same finding was in New Zealand that 77% attended in later trimesters (21) , more than half of them went to antenatal care centers for less than 4 visits with same finding in Entab hospital &New Zealand that attendance was 96% , 99.1%for once respectively (20) , (21) ,also more than half of them had taken ferrofol tablet mostly for once, the high prevalence of anemia in our population is because of unsatisfactory use of hematinic supplements that 150 mg of ferrofole /day after 20 weeks of gestation is sufficient to prevent iron deficiency anemia in mother (22), a multiple micronutrient supplementation decreases the risk of low birth weight fetus and maternal anemia (23) , more than half of pregnant females had taken tetanus vaccine for once, this presentation is common in our countries as in Tunis 68.5% (24) & in Entab hospital is 91% (22). There was no proper education that most of them without spacing between one child &another. Regarding habits: more than half of them drunk tea frequently &directly after meal, the same results were found in most Arab countries (25). Regarding dietary pattern there was average intake of red meat & poor intake of white meat &liver while there was good intake of milk & milk products, legumes, seeds except rice & macaroni had poor intake. For vegetables & fruits more than half of them had average intake of tomato, dates, banana but more than half of them had poor intake of green pepper, parsley& green leaves, apples, mango & guava while all of them had poor intake of spinach & chard , grape, this status is reflected by low socio- economic status that makes micronutrient deficiency both clinical &subclinical are more common (26) , (27) .

Conclusion;

More than half of respondents were anemic ,with high risk

pregnancy &still had insufficient coverage & inadequate utilization of antenatal care services which mostly affected by maternal education & occupation , husband's education & availability with poor spacing between last child & another which affected by parity while for dietary pattern there was average & poor intake of food that rich with iron .

Authors contributions :

Dr. Ban Nadhuim AL- Any: Collection of data & data analysis

Dr. Deyaa AL Deen AL- Saied : Data analysis

Dr. Seeham Mohammed: Estimation of hemoglobin level in blood. Detection of malaria parasite in blood.

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