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Original Article

Anaemia and Its Associated Risk Factors Among Pregnant Women in the Gambia

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Abstract

Background: Anaemia is a global health problem affecting about a third of the world's population. In pregnancy, it is a public health concern with consequences for mothers and infants, including maternal death and infant mortality. In low-income countries, 25% indirect maternal mortality and 30% neonatal deaths are due to anaemia in pregnancy. This study aimed to determine the prevalence of anaemia among pregnant women in The Gambia and identify common risk or predisposing factors associated with anaemia in pregnancy among them. **Methods:** This was a cross-sectional study of 180 consenting pregnant women, who attended two secondary-care level hospital for antenatal care between March and May 2023. They were selected by using a simple random sampling technique. Data were collected using a validated structured questionnaire and participants' current antenatal cards while SPSS software version 26.0 was used for analyzing data. **Results:** The findings of this study shows that 21.7% and 8.3% of the pregnant women were anaemic at booking using 11.0g/dl and 10.0g/dl as cut off respectively with the mean haemoglobin concentration of 11.76+-1.36g/dl. The study revealed that anaemia during pregnancy is associated with factors such as educational level (p=0.048) and the average income per month (p=0.039). Majority of the women, (166, 92.2%), have taken malaria prophylaxis but only 95 (52.8%) admitted to sleeping under insecticide-treated mosquito nets which shows the low prevalence of Malaria among the participants (5.6%) **Conclusion:** The prevalence of anaemia among pregnant women in the Gambia is 21.7% which implies that anaemia is still a public health problem. Therefore, it is important for actions like early booking and improvement on health and nutritional education to be taken in order to reduce anaemia among pregnant women.

Keywords: Pregnancy, Anaemia, Prevalence, Haemoglobin, Risk factors, Gambia

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Introduction

Anaemia during pregnancy is a public health problem especially in developing countries and is associated with adverse outcomes in pregnancy[1]]. The prevalence of anaemia is increasing at an alarming rate in Africa among non-pregnant from 37.7% to 41.5% and from 38.9% to 48.7% for pregnant women with an overall all prevalence of 62.3% [2]. In the Gambia, the prevalence of anaemia among women of reproductive age group has been reported to be about 57.5%, and its ever-lowest prevalence was 56.5% in 2011[3]]. However, the Gambia Demographic Health Survey (GDHS) 2019–20 reported a prevalence of anaemia among pregnant women to be was 44% [4].

Anaemia is a multifactor disease and can act both as a risk factor or a consequence of a disease [5]. There are various modifiable and non-modifiable factors affecting anaemia in combination or alone. These may range from ethnicity, gender, age, socio-demographic status, dietary habits, physical and mental health, gynaecological/obstetric history, cancers, and anti-cancerous drugs to genetic makeup [5]. Specific risk factors include deficiency of iron, worm infestation, repeated pregnancies, menorrhagia, postpartum haemorrhage, gastric ulcers, and haemorrhoids, intake of aspirin / non-steroidal anti-inflammatory drugs, and pure vegetarian diet [5].

The prevalence of anaemia is an important health indicator and when it is used with other measurements of iron status the haemoglobin concentration can provide information about the severity of iron deficiency [6]. Together with obstetric haemorrhage, anaemia in pregnancy contributes up to 40% of maternal mortality and morbidity in this region [7]. The high levels of anaemia in pregnancy have been seen not only to have a link with iron deficiency, but also with micro-nutrient deficiency and multiple infections, such as HIV, STI, UTI, and hook worms [7-9]. Pregnancy is also a state of immune-modulation, increasing the risk of malaria, hookworms, and other infections. These infections together with iron and folate deficiencies predisposes to anaemia. In Gambia, the high prevalence of anaemia among pregnant women constitutes a severe public health problem [10] with the attendant increased risk of morbidity and mortality in pregnant women as well as increased risk of foetal, neonatal and overall infant mortality [11].

Methodology

This was a descriptive cross-sectional study which was at Bundung Maternal and Child Health Hospital (BMCHH) and Fajikunda Major Health center (FMHC). Both hospitals are secondary health centres focusing on maternal and child health and are located at Serekunda community which has a dense population of 350,000 people. Data collected involved a baseline review of all the women attending antenatal clinic in BMCHH and FMHC, the study had a sample size of 180. Patients' information was collected through a structured questionnaire and from their antenatal cards. The study included consenting pregnant women aged 18 and above without any major or chronic medical illness while women who were transfused in less than 2 weeks were excluded.

The data collection involved the daily identification of all women who attended antenatal clinic. Information was collected from those who consented through written informed consent to participate in the research. The data collected included the socio-demographic characteristics (such as age, residence, religion, marital status, and educational status), obstetric and antenatal care characteristics like gestational age, whether pregnancy was planned, history of bleeding in pregnancy, if malaria prophylaxis has been taken and how many doses, use of insecticide treated nets to sleep if anti-worm medication has been taken. Additionally, clinical characteristics like weight and haemoglobin concentration at booking and subsequent times were retrieved from their folders. Ethical clearance was obtained from the American International University of West Africa Ethics and Research committee (AERC) and also from the Ethics and Research Committee of the hospitals.

Data were analyzed using the statistical package for social sciences (SPSS package) version 26.0. Descriptive statistics were computed for all relevant variables. Comparative analysis was done with the chi-square test and level of significance was set at $P < 0.05$. Association between anaemia and some risk factors in pregnancy was tested using chi-square.

Results

The study recruited a total of 180 consenting participants in 2 major hospitals within the Kanifing municipal: Bundung maternal and Child Health Hospital (BMCHH) 118 participants, and Fajikunda Major Health Centre (FMHC) – 62 participants. The mean age of the women in this study was 26.58 ± 4.8 years with a range of 18 to 39 years (Table 1). About two-fifths, 79(43.9%), had secondary education while about one-fifth had only primary education (39, 21.7%). Majority of the women are unemployed (83.3%) and also have no income (71.1%) as a result of being housewives (55.6%). Husbands' income per month was unknown to most of the participants, 141 (78.3%).

Among the participants in table 2, about 32.2% have at least 2 children and majority, 101(56.1%), are currently in their third trimester. Majority of pregnancies were planned (77.8%) while the inter-pregnancy interval was less than 12 months in 46.1%. Some of the participants reported episodes of bleeding in the index pregnancy (7.2%) and majority have had less than four antenatal visits (106, 58.9%).

As shown in table 3, majority of the women had a haemoglobin reading at booking of 11 g/dl and above.

Table 1: Socio-demographic characteristics of the participants, N=180

Variables	Frequency (N)	Percent
Age group		
18-24	74	41.1
25-29	57	31.7
30-34	36	20.7
35-39	13	7.2
Marital Status		
Married	177	98.9
Single	2	1.1
Widowed	1	0.6
Type of marriage		
Monogamous	150	83.3
Polygamous	28	15.6
Unmarried	2	1.1
Religion		
Islam	170	94.4
Christianity	10	5.5
Educational level		
No form of education	9	5.0
Arabic	33	18.3
Primary	39	21.7
Secondary	79	43.9
Tertiary	20	11.1
Occupation		
Unemployed	100	55.6
Employed	25	13.9
Self-employed	48	26.7
Student	7	3.9
Husband/Partner's Educational level		
No form of education	11	6.1
Arabic	44	24.4
Primary	8	4.4
Secondary	65	36.1
Tertiary	52	28.9
Husband/Partner's Occupation		
Unemployed	0	0
Employed	94	52.2
Self-employed	85	47.2
Student	1	0.6
Average income (Dalasis per month)		
No income	128	71.1
<2500	5	2.8
2501-5000	26	14.4
5001-7500	11	6.1
>7500	10	5.5
Husband's income (Dalasis per month)		
Not known	141	78.3
<2500	3	1.7
2501-5000	11	6.1
5001-7500	3	1.7
>7500	22	12.2

Table 2: Obstetrics and Antenatal care of participants

Variables	Frequency, N	Percentage
Parity		
0-1	113	62.8
2-4	58	32.2
≥5	9	5.0
Was the pregnancy planned?		
Yes	140	77.8
No	40	22.2
Gestational age at current ANC visit		
First	4	2.2
Second	75	41.7
Third	101	56.1
Inter-pregnancy interval (months)		
< 12	83	46.1
12-24	38	21.1
> 24	58	32.8
Bleeding in this pregnancy		
Yes	13	7.2
No	167	92.8
Number of antenatal visits		
Below 4	106	58.9
4 and above	74	41.1
Malaria prophylaxis		
Yes	166	92.2
No	14	7.8
Treatment for malaria		
Yes	10	5.6
No	70	94.4
Mosquito net use		
Yes	85	47.2
No	95	52.8
Anti-worm medication		
Yes	52	28.8
No	128	71.2

(78.3%), 13.3% had a reading of 10-10.9 g/dl and a few (8.3%) had <10 g/dl. Majority of the women have taken prophylaxis (92.2%) and among those who have taken malaria prophylaxis, about 28.3% took 2 doses, while 16.7% had taken 4 doses of sulphadoxine pyrimethamine (Table 3). Ten of the participants, 5.6%, had received full treatment for Malaria in the index pregnancy and only 95 (52.8%) admitted to sleeping under insecticide-treated mosquito nets. In addition, a little above one-quarter of the participants (52, 28.8%) have taken anti-worm medication. Concerning previous history of anaemia, 20 (11.1%) of the participants had positive history of anaemia in previous

pregnancies although currently, almost all the patients, 171(95%), were placed on prophylactic iron and folic acid supplements. It is noted that virtually all participants in FMHC were on anti-worm medication.

Table 3: Factors Associated with Anaemia in Pregnancy

Variable	Freq, N	Per-centage
Haemoglobin concentration at booking (g/dl)		
<10	15	8.3
10 – 10.9	24	13.3
≥11	141	78.3
Malaria prophylaxis		
Yes	166	92.2
No	14	7.8
Treated malaria in this pregnancy		
Yes	10	5.6
No	170	94.4
History of anaemia in previous pregnancies		
Yes	20	11.1
No	96	53.3
Not applicable (primigravida)	64	35.6
Are you on Iron supplements		
Yes	171	95
No	9	5
Are you on Folic acid supplements		
Yes	171	95
No	9	5

Table 4: Relationship Between Socio-Demographic Characteristics and Haemoglobin Concentration

Variable	< 11g/dl	≥ 11g/dl	Total	Chi-square	P-value
Educational level					
No form of education	3	6	9		
Arabic	6	27	33		
Primary	5	34	39	9.563	0.048
Secondary	24	55	79		
Tertiary	1	19	20		
Total	39	141	180		
Average income in dalasis					
1000-2500	3	2	5		
3000-5000	4	22	26		
5500-7500	1	10	11	10.069	0.039
7600-1000	3	3	6		
10500 and above	0	4	4		
Total	11	41	41		
Age group of participants					
18-24	11	63	74	6.943	0.074
25-29	17	40	30		
30-34	6	30	8	6.943	0.074
35-39	5	8	141		
Total	39	141	180		
Family size					
4 and below	18	57	75		
5-9	11	43	54		
10-14	3	19	33	1.234	0.745
15 and above	7	22	29		
Total	39	141	180		

Table 4 showed that there was a significant relationship at a <0.05 significance level, between haemoglobin level at booking using 11g/dl and the following: Educational level (p=0.048) and Income in Dalasi (p=0.039). No significant relationship between haemoglobin at booking using 11g/dl and age, family size, marital status, types of marriage, partners income, partners educational level (p>0.05).

DISCUSSION

Anaemia in pregnancy continues to be major health problem responsible for significant maternal and perinatal morbidity and mortality worldwide. This study provided an opportunity to study factors such as socio-demographic, obstetrics and antenatal care, and associated risk factors and their associations with the occurrence of anaemia in pregnancy. The prevalence of anaemia in this study is 21.7% according to WHO classification. However, if a cut of 10.0g/dl is used, the prevalence will be 8.3%. This is a very important consideration because in some other developing countries like Nigeria, the cut-off being used for anaemia in pregnancy is 10g/dl. This is because studies had shown that many women will have no obvious negative impact of anaemia in pregnancy until the value is less than 10g/dl. Using a cut-off of 11g/dl in the Gambia makes one out of every five pregnant women to be anaemic.

The factors associated with anaemia in this study included are the use of malaria prophylaxis, use of Insecticide treated net, use of anti-worm, and history of anaemia in previous pregnancies. About half, 95 (52.8%)

admitted to sleeping under insecticide-treated mosquito nets while a greater percentage of the pregnant women reported adherence to sulphadoxine pyrimethamine (IPT regimen) and this may also contribute to the relatively low malaria prevalence observed in this study. Notable also is that unlike the report by Auerbach and colleagues where almost equal proportions of pregnant women were recruited across the three gestational periods and the highest malaria prevalence was recorded among those in their third trimester of gestation [12], the majority of the pregnant women in our study were in their third trimester of gestation followed by those in their second trimester.

Majority of the participants, 171(95%), were placed on prophylactic iron and folic acid supplements. This study revealed that the risk of developing anaemia was significantly more among pregnant women who did not take iron and folic acid supplements compared to those who took these supplements. This finding is in line with other previous studies such as Ethiopia, Uganda, Nigeria, Vietnam and India which indicated that lack of iron supplementation is among the most significant risk factors for developing anaemia during pregnancy. Therefore, to reduce the risk of maternal anaemia, iron deficiency and poor pregnancy outcomes, the WHO guidelines recommend a standard daily oral dose of 60 mg iron and 400 µg folic acid supplements throughout pregnancy, to begin as early as possible as a part of antenatal care (ANC) programs.

In the Gambia, the current strategy for reducing anaemia during pregnancy includes the provision of iron and folic acid tablets, advice on dietary intake, diagnosis and treatment of malaria and hookworms. Iron and Folic Acid Supplementation (IFAS) is the most common and cost-effective strategy used to control anaemia in the developing countries including Gambia and is used as both a preventive measure and a treatment option. In view of the high prevalence of anaemia during pregnancy, it is imperative to ensure that interventions that will enhance prevention and control of anaemia should be strengthened by encouraging early booking for antenatal care as this provides opportunities for early detection and treatment of any health problem that can arise during pregnancy while IFAS is also initiated as recommended. Female education and economic empowerment have the potential to positively contribute significantly to the reduction in the rate of anaemia in pregnancy in the Gambia

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