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Original Research Article

Common morphologic type of anemia among pregnant teenagers in Western Uganda

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ABSTRACT

Background: Anemia remains a serious health burden all over the world, more so among pregnant women. A lot of morbidity and mortality has been attributed to anemia in pregnancy. The problem is even much bigger among special groups of pregnant women such as the teenagers. The common morphologic type of this obstetric complication however remains a mystery among several populations across the world.
Methods: We carried out a cross-sectional study for three months; between August 2021 and October 2021. A total of 288 pregnant teenagers aged between 13 and 19 years attending antenatal care at Hoima Regional Referral Hospital (HRRH) in western Uganda were consecutively enrolled. Short interviewer-administered questionnaires and laboratory report forms were used to obtain data. Descriptive statistics using SPSS version 23 was applied to present the data.
Results: 75 (26%) out of the 288 pregnant teenagers had anemia. Majority 40 (53.3%) had microcytic anemia, followed by normocytic anemia 25 (33.3%) while 10 (13.3%) had macrocytic anemia.
Conclusions: Microcytic anemia remains the most common morphological type affecting pregnant teenagers at HRRH, western Uganda.

Keywords: Morphologic patterns of anemia, Anemia in pregnancy, Pregnant teenager

INTRODUCTION

Anemia continues to be one of the most commonly encountered medical disorders during pregnancy.[1] According to the WHO, eradication of anemia is a key component of safe motherhood as it has been implicated in several maternal deaths all over the world, more so in the resource constrained nations. Anemia is a big threat to pregnant women particularly in Asia and Africa, with up to 6.4% deaths attributable to it only in Africa alone.[2] A wide range of causes characterized as microcytic, normocytic, and macrocytic anemia has been documented by different scholars across the globe. These however, vary largely during pregnancy and across different populations. The problem is more serious among risky pregnant groups such as the teenagers.[3] According to Derme and colleagues, pregnant teenagers are three times more at risk of developing anemia during pregnancy compared to the rest of the pregnant women. Unfortunately, the morphologic types of most of the anemias observed in this group of pregnant women have not been well elaborated in most of the parts of the world including Hoima where this study was conducted.

METHODS

We conducted a three months cross-sectional study from August 2021 to October 2021. The study was conducted at the antenatal care clinic of Hoima Regional Referral Hospital (HRRH) in Hoima city, western Uganda. HRRH

is a government hospital located 230 kilometers from the capital Kampala. The hospital is well equipped with a bed capacity of 400. The facility provides many services including antenatal care to all pregnant women on every weekday. All pregnant teenagers aged 13 years to 19 years in the third trimester who attended antenatal care clinic at this hospital during the study period were recruited into the study consecutively until the required sample size was reached. The sample size was calculated using Daniel formula for sample size estimation.[4]

Eligible pregnant teenagers were recruited in the study after education and counseling about the study. Laboratory report forms were used to collect data on whether or not the respondent was anemic basing on the hemoglobin status. A short-structured investigator administered questionnaire was used to obtain data concerning the patient's socio-demographics. Sample collection for Complete blood count (CBC) to ascertain the hemoglobin levels was done according to the standard WHO protocols.[5,6] The phlebotomy site selected was either the antecubital fossa or forearm, where a vein of good size, visible, straight, and clear was located. A tourniquet was applied about 4-5 finger widths above the venipuncture site and the vein was re-examined. While wearing clean gloves, the chosen site was swabbed with alcohol (70%) and allowed to dry completely. The vein was anchored by holding the patient's arm and placing a thumb below the venepuncture site, phlebotomy was performed at approximately 30-degree angle and 4 ml of blood was collected and put in well-labeled vacutainers which contained ethylenediaminetetraacetic acid. The pressure was applied to the site until bleeding completely stopped. The sample was then taken to the laboratory for complete blood count analysis. The laboratory technician used an automated analyzer (Celltac, automated hematology analyzer, MEK-6400, NIHON KOHDEN). The manufacturer-supplied controls were run every morning to ensure that the analyzer was operating within 2.0 standard deviations. The closed model of blood sampling was used; the analyzer automatically sampled blood, processed, analyzed, and printed out the hemoglobin concentration levels. Meanwhile, part of every 10th sample obtained was taken to Lancet laboratory based in Hoima city for quality assurance. Pregnant teenagers with a hemoglobin concentration of less than 11.0 g/dl were categorized as anemic. Depending on the Mean Corpuscular Volume (MCV), anemia was classified as microcytic if the MCV was less than 82 fl, normocytic if the MCV was between 82 fl and 98 fl, and macrocytic if the MCV was more than 98 fl.

We ensured voluntary recruitment of all the study participants throughout the study, under observance of standard operating procedures for COVID-19 which included social distancing, use of face masks and regular cleaning of hands using a sanitizer and/or soap . Informed consent from the participants was obtained after fully explaining the details of the study to them in English and Runyoro-Rutooro, the dominant local language for those who did not understand English. Participants were not forced to enroll for the study if they did not want to. Priority was not given in terms of tribe, interest group, race, or religion. Participants were free to withdraw from the study at any time they wished without coercion or compromise of care they were entitled to. Data were coded and entered in Excel version 2010 and later exported to IBM SPSS version 23 for analysis. Descriptive statistics was applied to present the data in frequencies and percentages for the different morphologic types.

RESULTS

75 (26%) out of the 288 pregnant teenagers had anemia. Of these, majority had microcytic anemia 40 (53.3%), followed by normocytic anemia 25 (33.3%). Macrocytic type of anemia was the least with 10 (13.3%) teenagers affected. This is shown in Figure 1.

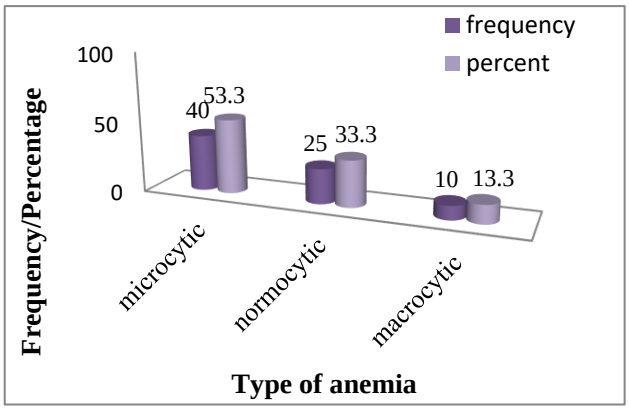

Figure 1: Types of anemia according to MCV among pregnant teenagers in the third trimester attending ANC at HRRH.

DISCUSSION

The current study found that out of the 75 pregnant teenagers in the third trimester attending antenatal care clinic at Hoima Regional Referral Hospital (HRHH) who had anemia, majority had microcytic anemia 40 (53.3%), followed by normocytic anemia 25 (33.3%). The macrocytic type of anemia was the least with ten teenagers (13.3%) affected. These findings were higher than those of Bopape et al in South Africa where microcytic anemia was evident in 12% and macrocytosis in 4% of the teenagers and Kimbi et al in Cameroon where microcytosis was found in 14.7% and macrocytosis in 1.1%.[7,8] However, it was lower than one reported by Abusharib in Sudan who noted that 58% had a dimorphic pattern (microcytic and macrocytic), followed by 25% with a microcystic pattern and 10% with a macrocytic pattern and 7% with a normocytic pattern as well as the findings of Okia et al in Uganda who found 8.3% with normocytic anemia, 50% microcytic anemia, and 41.7% macrocytic anemia.[9,10] Despite the discrepancies in the magnitude of the different types of the anemia detected, the general impression based on all these studies is that most pregnant women manifest with microcytc type of anemia. We associate this to iron-deficiency problems commonly experienced by pregnant

women more so the teenagers. As noted by Hoque, iron deficiency anemia is the most prevalent nutritional deficiency problem affecting pregnant women and may develop during pregnancy because of the increased iron requirements to supply the expanding blood volume of the mother, the rapidly growing fetus and the placenta.[11] It has indeed been hypothesized that women particularly those in the sub-Saharan Africa within which the present study was conducted may enter pregnancy with seriously depleted iron stores such that when pre-pregnancy iron stores are low, the amount of iron required during the last half of their pregnancy cannot easily be met by diet and therefore the risk of iron deficiency anemia could be high especially toward the end of the third trimester. This is a likely problem in pregnant teenagers, given the fact that they tend to have multiple factors that predispose them to anemia. Most of them are likely to be of low education, low socioeconomic states, and are at risk of nutritional deficiencies from poor eating vices aimed at attempting to lose weight through dieting, skipping meals and food faddism among others.[12]

Limitation

This being an institutional based study impacted on our overall prevalence for the different morphologic types of anemia. We could not include full details of the baseline population and number of pregnant teenagers in this whole study area. We believe this is an important aspect of future research in the area.

CONCLUSION

Microcytic anemia remains the most common morphological type affecting pregnant teenagers at HRRH. Routine assessment of all anaemic pregnant teenagers for the morphologic type particularly in the resource constrained countries needs to be emphasized if we are to curtail anemia-related complications in this category of pregnant women.

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Ethical approval: The study was approved by the institutional ethics committee

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