OBSTETRICS

Anemia in Pregnant Women Attending the Antenatal Care Clinic, Mae Sot Hospital

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ABSTRACT

Objectives: To determine prevalence and demographic characteristics of anemic Thai and Myanmar pregnant women attending the Antenatal Care Clinic, Mae Sot Hospital, Mae Sot, Tak province, Thailand.

Materials and Methods: A cross-sectional study was conducted in 500 pregnant women between October 2011 and April 2012. Blood samples were obtained for determination of hematocrit level and screening for thalassemia. Information on age, ethnic affiliation, gestational age, gravida, level of education, occupation, household income, and area of residence were recorded.

Results: Overall prevalence of anemia was 49% (Thai 36%; Myanmar 60%) and mean hematocrit level was 33.1±3.1%, anemia was significantly focus in second and third trimester more than first trimester of pregnancy (OR = 4.23, 95%CI 2.64 – 6.79 and OR = 6.30, 95%CI 3.35–11.85, respectively (p-value < 0.001).

Conclusions: Anemia in both Thai and Myanmar pregnancy was common in Mae Sot.

Keywords: pregnancy, anemia, antenatal care clinic

Introduction

Anemia in pregnant women is regarded as a major risk factor for an unfavorable pregnancy outcome, it has been associated with maternal mortality and to both maternal and fetal morbidity[1-5]. Anemia reduces an ability of pregnant women to survive bleeding during and after childbirth. Women with anemia are particularly having at risk of dying from obstetric complications during or after pregnancy than women who do not have anemia. Moreover, anemia-related fatigue also makes the effort of labor more difficult, thus prolonging delivery. According to the World Health Organization (WHO), anemia in pregnancy is defined as hematocrit concentration less than 33%[6].

Anemia during pregnancy continues to be a common clinical problem with high prevalence (35 to 75%) in many developing countries[7]. In Thailand, prevalence of anemia among pregnancy shows variations in different study populations, ranging from 5.6 to 20.1%[8-12]. However, no previous studies have so far been carried out in determining the prevalence rate of anemia in pregnant women living in the rural area. Epidemiological studies, scientific and technical information are not available for outline its impact on

public health in this region. Anemia during pregnancy can be caused by many factors including nutritional deficiency[13-15], parasitic infestations (helminthiasis, intestinal protozoa)[15,16], hemoglobinopathies (thalassemia and hemoglobin variants)[9,10], infection with malaria[17-19], multiparity[20] and socioeconomic position are all important known risk factors for anemia in pregnant women. Therefore, in order to aid in planning better prevention and control strategies for anemia in pregnancy, this study aimed to assess the prevalence and demographic characteristics of pregnant women with anemia attending the Antenatal Care Clinic, Mae Sot Hospital, Tak province. Of note, Mae Sot shares a western border with Myanmar, hence there is substantial population of Myanmar refugees and economic migrants. Due to the socioeconomic, behavioral and environmental differences that may affect the anemic situation, so Thai and Myanmar pregnant women were analyzed separately.

Materials and methods

The total of 568 pregnant women who attended the antenatal clinic (ANC) at Mae Sot Hospital, Mae Sot district, Tak province, from October 2011 to April 2012 were recruited in the study, of these 68 who had previously attended the Antenatal Care Clinic (ANC) of another health services and had already received iron supplement were excluded from the study. The remaining 500 pregnant women were included for the analysis. The computer software is used for sample size calculation base on the prognostic factors from previous study. Estimated sample size for two-sample comparison of proportions, alpha = 0.05, power = 0.80, index group 0.44, comparison group 0.27 and the ratio of sample size of study group to comparison group = 1:2. The largest sample size will be required 200 of comparison group cases and 100 cases with anemic patients[21]. All subjects were recruited using protocols approved by the Ethics Committees of Mae Sot Hospital. An informed consent was obtained from pregnant women prior to enrollment in the study. Interviews were administered to obtain demographic information about age, ethnic group, gravida, level of education, occupation, household income and area of residence.

Gestational age was estimated from interview based on the date of last menstruation and the ultrasound scan measurements. Blood samples were collected from the pregnant women at the date of first attending the ANC and hematological investigations were carried out to determine hematocrit level and thalassemia. Screening for thalassemia was carried out in Thai pregnant women by dichlorophenolindophenol (DCIP) precipitation test and the mean corpuscular volume (MCV) value. Cases of positive for thalassemia screening were followed by hemoglobin typing (automated low-pressure liquid chromatography (LPLC) Hb Analyzer; Hb Gold, Drew Scientific Ltd., Barrow-in-Furness, Cumbria, England).

According to WHO criteria, anemia was defined as blood hematocrit level less than 33%[6,13]. Women who were anemia at any time during pregnancy were considered anemia in pregnancy. Comparison of the risk factors between anemic and non-anemic pregnancy were performed using Chi-square statistics and p-value less than 0.05 was considered statistical significance. Odds ratio was used as an approximation for relative risk. The data was analyzed using PASW Statistics 18.0 (SPSS Inc., Chicago, Illinois, USA).

Results

Two main ethnic groups on the study area were Thai and Myanmar. A total of 500 pregnant women were enrolled in this study; 230 (46.0%) were Thai and 270 (54.0%) were Myanmar. Mean hematocrit was slightly lower in the Myanmar (32.6 ± 3.0%) pregnant women as compared to the Thai (33.7 ± 3.2%). Risk of odds ratio of anemia was twice as high among non-Thai women compared to Thai women (OR = 2.66; 95%CI: 1.85-3.85; p<0.001). The mean age was 27.4 ± 7.2 years old with a range of 15 to 40 in non-anemic and 27.4 ± 7.2 years old with a range of 15 to 40 in anemic pregnant women. Percentage of women who were 20 years old and less was 14.2%. Maternal age did not show any association to anemia prevalence among Thai (p=0.58) and Myanmar pregnancy (p=0.21). However, anemia seemed to be more prevalent in teenage pregnancy (OR = 1.47; 95%CI: 0.69-3.14 in Thai and OR = 2.13, 95%CI: 0.87-

5.21 in Myanmar).

In Thai population, most of anemic pregnant women attended their first ANC visits in the second trimester (57.83%) while most of non-anemic mother attended in the first trimester (50.34%) (p = 0.001). In Myanmar population, most of both anemic and non anemic pregnant women attended their first ANC visits in the second trimester (73.46% and 62.96%, respectively) (p < 0.001). There was significant different of income (5,000-10,000 Baht/moth) between anemic and non-anemic group in Thai population.

Due to the limited resource and data available of thalassemia screening in Myanmar pregnant women, the cross-sectional analysis of anemia, gestational age and prevalence of thalassemia was performed only in 230 Thai pregnant women. Thalassemia diagnosis was carried out in 67 cases of positive DCIP tests or MCV less than 80 fl. Among these thalassemia carriers and diseases were found in 29.1% (67/230 cases). Of these alpha-thalassemia trait was found in 7.0% (16/230), beta-thalassemia trait 6.1% (14/230), HbE trait 14.8% (34/230), 1 case was homozygous HbE and 2 cases were Hb Bart's H-CS disease. Anemia were found to be more prevalent among carriers of thalassemia than those without such traits (36.1% (30/83) vs. 25.2% (37/147). Interestingly, women carrying thalassemia were observed to exhibit a higher prevalence of anemia in the first trimester of pregnancy than those non-thalassemia carriers (54.5% (12/22) vs. 28.4% (21/74); OR = 3.03; p=0.02), while this difference was not found in the second (27.1% (13/48) vs. 23.4% (15/49); OR = 1.21; p=0.33) and third trimester of pregnancy (38.5% (5/8) vs. 11.1% (1/8); OR = 5.00; p=0.07). No significant association was found between prevalence of anemia and the women's age or parity and level of education women in any trimester of pregnancy. Residence in the outlying village and border was associated with a two-fold increase in the odds of anemia (OR = 2.00; 95% CI: 0.90-4.44; p=0.08) in the second trimester of pregnancy, but this was not found in the first trimester of pregnancy.

Discussion

Anemia in pregnancy has a significant impact on the health of the fetus as well as that of the mother. Due to the limited resource of hematological analysis among the Myanmar, the anemia in this study is determined by the blood hematocrit levels less than 33% as suggested by WHO[6]. Better economic situation and nutritional status of the Thai mother are supposed to explain the higher prevalence rate of anemia in Myanmar (60%) compared with those in Thai mothers (36.1%).

The prevalence of anemia reported in this study differs from 19.2% reported from the previous study in pregnant women resided in Bangkok[8], 20.1% in Chiang Mai[10], 22.1% in Lampang[11] and 9.8% in Nakhonsawan[12]. However because of this study was done on a population limited in a smaller geographical area, hence it does not claim to have assessed the anemia prevalence among pregnant women in all rural area of Thailand. It is therefore, suggested that the pregnancy-related anemia and its possible causes are to be identified and addressed to the pediatricians, gynecologists and all the related practitioners.

Present study revealed that the risk for anemia was higher among low household income pregnant women than the high-income group which may be interpreted as an indicator for poor dietary intake and poor absorption of other key nutrients needed for red blood cell production.

Area of resident was found to have a significant effect on pregnant women's risk of anemia, the accessibility of both food and health care are higher in the main town than in the outlying villages and these may explain much of the lower risk of anemia in the main town. Many people have been living on a monotonous cereal- or legume-based diet and have a little access to animal protein or a variety of fruit and vegetable. In addition, some cultural beliefs inhibit the pregnant women not to take some foods which render them at a risk of micronutrient deficiencies[22].

Pregnant women are particularly susceptible to anemia because demand for iron and other vitamins is increased due to physiological burden of pregnancy. The inability to meet the required level for these substances either as a result of dietary deficiency or infection gives rise to anemia[23]. Iron deficiency-anemia

is the most prevalent nutritional problem and one of the most frequent complications related to pregnancy[24,25]. In Thailand, the national prevalence of iron deficiency anemia among pregnant women was 13%[26]. Parasitic infestations are responsible for many cases of anemia and gastrointestinal upset. In this area, worm infections and intestinal protozoa infections are common[27]. Even though many other factors, including both nutritional and non-nutritional ones can cause anemia in malaria endemic areas[13,15], several studies have reported malaria infection as the primary reason for anemia among pregnant women[18,19]. For better understanding further research is needed to explore the causes of anemia, in addition to present of thalassemia trait, among the pregnant women in rural Thai.

Conclusion

The prevalence of anemia among the rural pregnant women in Mae Sot district of western Thailand was more common than reported from the other parts. In addition to gestational age, the data suggests that maternal age, household income and area of residence are also the important risk factors for anemia in pregnancy.

Acknowledgements

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ภาวะโลหิตจางในหญิงตั้งครรภ์ที่ฝากครรภ์ที่คลินิกฝากครรภ์ในโรงพยาบาลแม่สอด

อรนุช ศิริวงษ์

วัตถุประสงค์ :   เพื่อศึกษาสถานการณ์และวิเคราะห์ปัจจัยเสี่ยงของภาวะโลหิตจางในหญิงตั้งครรภ์คนไทยและพม่าที่มาฝากครรภ์ที่ รพ.แม่สอด อำเภอแม่สอด จังหวัดตาก

วัสดุและวิธีการ :   เป็นการศึกษาวิจัยภาวะโลหิตจางแบบภาคตัดขวางในหญิงตั้งครรภ์จำนวน 500 ราย ระหว่างเดือนตุลาคม พ.ศ. 2554 ถึงเดือนสิงหาคม พ.ศ.2555 หญิงตั้งครรภ์ได้รับการเก็บเลือดเพื่อตรวจระดับฮีมาโทคริตและพาหะธาลัสซีเมีย ร่วมกับการบันทึก ข้อมูลอายุ เชื้อชาติ อายุครรภ์ จำนวนครั้งที่ตั้งครรภ์ ระดับการศึกษา อาชีพ รายได้ของครอบครัว และที่อยู่อาศัย

ผลการศึกษา : พบภาวะโลหิตจางร้อยละ 49 ในหญิงตั้งครรภ์ทั้งหมด โดยพบความชุกร้อยละ 36 ในคนไทยและร้อยละ 60 ในคนพม่า พบระดับฮีมาโทคริตระหว่าง 23.0 – 40.0% และค่าเฉลี่ยเท่ากับ 33.1 ± 3.1% หญิงตั้งครรภ์ในช่วงไตรมาสที่สองและสามของการ ตั้งครรภ์ตรวจพบความชุกของภาวะโลหิตจางสูงกว่าหญิงตั้งครรภ์ในช่วงไตรมาสแรกของการตั้งครรภ์ โดยพบมีความเสี่ยงสูงเป็น 4.23 เท่า และ 6.30 เท่า ตามลำดับ

สรุป : ภาวะโลหิตจางในหญิงตั้งครรภ์ทั้งชาวไทยและพม่าพบมากในโรงพยาบาลแม่สอด