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ANEMIA AND HEMOGLOBINOPATHIES IN PREGNANT WOMEN ATTENDED IN A PUBLIC HOSPITAL

ANEMIA E HEMOGLOBINOPATIAS EM GESTANTES ATENDIDAS EM HOSPITAL PÚBLICO

ANEMIA Y HEMOGLOBINOPATÍAS EN MUJERES EMBARAZADAS ATENDIDAS EN HOSPITAL PÚBLICO

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ABSTRACT

Objectives: to identify the demographic profile and frequency of anemia and hemoglobinopathies, as a basis for future implementation of actions aimed at pregnant women in the public health domain. ***Method:*** this is a cross-sectional study developed with pregnant women attended in a university hospital at Mato Grosso do Sul, Brazil. Blood samples were collected for the erythrogram analysis for detection of anemia and selective and specific tests for abnormal hemoglobin. The patients regarded as indigenous and mentally ill, as well as inmates, were excluded from the research, as they represent a vulnerable population which needs a cohort different from that of the sample. For data collection, a particular questionnaire was used. The research was approved by the Ethics Committee of Universidade Federal de Mato Grosso do Sul (UFMS), under the Protocol 873/2006. ***Results:*** of the 215 pregnant women under study, 20% were adolescents; 36.3% had incomplete primary education; 53.0% were non-Caucasian; 43.3% were from Campo Grande, Mato Grosso do Sul, Brazil; and 21.1% were of European descent. 17.7% had some type of anemia and, in the evaluation of hemoglobinopathies, 4.7% of patients were detected with some abnormal hemoglobin, with the following frequencies: 3.3% with HbAS; 0.9% with HbAC; and 0.5% with intermediate ß-thalassemia. ***Conclusion:*** the frequencies of anemia and hemoglobinopathy found in these pregnant women showed the importance of early diagnosis, revealing indicators able to provide a basis for preventive and assistance actions for adequate clinical monitoring, reducing maternal and neonatal morbimortality in the public health services. ***Descriptors:*** pregnant women; anemia; hemoglobinopathies; public health; nursing.

RESUMO

Objetivos: identificar o perfil demográfico e a frequência de anemia e hemoglobinopatias, como base para futura implementação de ações dirigidas a gestantes no âmbito da saúde pública. ***Método:*** trata-se de estudo transversal desenvolvido com gestantes atendidas em um hospital universitário de Mato Grosso do Sul. Foram coletadas amostras de sangue para realização de eritrograma para detecção de anemia e testes seletivos e específicos para hemoglobina anormal. As pacientes consideradas indígenas e doentes mentais, além das presidiárias, foram excluídas da pesquisa por representarem população vulnerável com necessidade de uma corte diferenciada da amostragem. Para coleta dos dados foi utilizado um formulário próprio. A pesquisa foi aprovada pelo Comitê de Ética da Universidade Federal de Mato Grosso do Sul (UFMS), sob o Protocolo n. 873/2006. ***Resultados:*** do total de 215 gestantes analisadas, 20% eram adolescentes; 36,3% tinham ensino fundamental incompleto; 53,0% eram não caucasoides; 43,3% eram nascidas em Campo Grande-MS; e 21,1% tinham descendência europeia. 17,7% apresentaram algum tipo de anemia e, na avaliação das hemoglobinopatias, foram detectados 4,7% de pacientes com alguma hemoglobina anormal, com as seguintes frequências: 3,3% com HbAS; 0,9% com HbAC; e 0,5% com talassemia ß intermediária. ***Conclusão:*** as frequências de anemia e hemoglobinopatia encontradas nessas gestantes evidenciaram a importância do diagnóstico precoce, revelando indicadores capazes de embasar ações preventivas e assistenciais para o acompanhamento clínico adequado, com redução da morbimortalidade materna e neonatal nos serviços de saúde pública. ***Descritores:*** gestantes; anemia; hemoglobinopatias; saúde pública; enfermagem.

RESUMEN

Objetivos: identificar el perfil demográfico y la frecuencia de anemia y hemoglobinopatías, como base para la futura implementación de acciones dirigidas a mujeres embarazadas, en el ámbito de la salud pública. ***Método:*** esto es un estudio transversal desarrollado con mujeres embarazadas atendidas en un hospital universitario de Mato Grosso do Sul, Brasil. Fueron recogidas muestras de sangre para realizar el eritrograma para detección de anemia y pruebas selectivas y específicas para hemoglobina anormal. Las pacientes consideradas indígenas y las enfermas mentales, además de las presidiarias, fueron excluidas de la investigación por que representan una población vulnerable con necesidad de una cohorte diferenciada de aquella de la muestra. Para la recogida de datos fue utilizado un formulario propio. La investigación fue aprobada por el Comité de Ética de la Universidade Federal de Mato Grosso do Sul (UFMS), bajo el Protocolo 873/2006. ***Resultados:*** de las 215 mujeres embarazadas estudiadas, 20% eran adolescentes; 36,3% tenían educación primaria incompleta; 53,0% eran no caucásicas; 43,3% nacieron en Campo Grande, Mato Grosso do Sul, Brasil; y 21,1% eran descendientes de europeos. 17.7% presentaron algún tipo de anemia y, en la evaluación de hemoglobinopatías, fueron detectados 4,7% de pacientes con alguna hemoglobina anormal, con las siguientes frecuencias: 3,3% con HbAS; 0,9% con HbAC; y 0,5% con ß-talasemia intermedia. ***Conclusión:*** las frecuencias de anemia y hemoglobinopatía encontradas en esas mujeres evidenciaron la importancia del diagnóstico precoz, revelando indicadores capaces de basar acciones preventivas y asistenciales para la monitorización clínica adecuada, con reducción de la morbimortalidad materna y neonatal en los servicios de salud pública. ***Descriptores:*** mujeres embarazadas; anemia; hemoglobinopatías; salud pública; enfermería.

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INTRODUCTION

A normal pregnancy is associated to physiological and anatomical adjustments that cause changes in the mother's organism, including the composition of the cellular and humoral elements in the circulating blood. The most frequent problems of the hematologic system, during the gravidic-puerperal cycle, are: anemia in prenatal care, bleeding during delivery and immediate postpartum, and puerperal thromboembolism; anemia is the hegemonic problem in this period.[1] Anemia affects almost half of the pregnant women: 52% in non-industrialized countries, compared with 23% in industrialized countries.[2,3] However, in Brazil, there is not consistent information for defining the prevalence of anemia in pregnant women.[4]

Hemoglobinopathies are the most common genic disorders, they may be divided into three groups: variants, thalassemias, and hereditary persistence of fetal hemoglobin. The phenotypic manifestations range from forms incompatible with life until asymptomatic heterozygous carriers who, under stress situations, such as during pregnancy, may manifest the disease. The modified genes are responsible for synthesis of the globin chains, which can result in a qualitative or quantitative change, and, as a consequence, lower survival.[5,6]

Considering that anemia is a public health problem worldwide and that the dispersion of abnormal hemoglobin genes may be explained according to the region, taking into account the origin of its settlers and also the fact that the city of Campo Grande, capital of the State of Mato Grosso do Sul, received an influx of people from many regions of Brazil and other countries, this study aimed to identify the demographic profile and frequency of anemia and hemoglobinopathies, as a basis for future implementation of actions aimed at pregnant women in the public health domain.

METHOD

Cross-sectional study carried out with 215 pregnant women attended in the Outpatient Clinic of Obstetrics and Gynecology from the University Hospital of Universidade Federal de Mato Grosso do Sul (HU/UFMS) within the period from January to August 2007. Patients regarded as indigenous, mentally ill, as well as inmates, were excluded from the research, since they represent a vulnerable population in need of a different cohort from that of sampling.

A form was applied to pregnant women after the approval by the Research Ethics Committee of UFMS, under the Protocol. 873/06, in order to identify the demographic profile of the selected population.

Next, for each participant, after her authorization, 4 ml of whole blood were collected through venipuncture, using 5% EDTA as anticoagulant. For all samples, erythrogram was performed through the automated method, with an ABX Horiba device – Pentra 120 model, for the detection of anemia; for the identification of abnormal hemoglobin, the blood underwent selective (erythrocyte morphology analysis; osmotic resistance in 0.36% NaCl; qualitative Hb electrophoresis on cellulose acetate, alkaline pH) and specific tests (differentiation electrophoresis in agar gel, acidic pH; quantitative electrophoresis on cellulose acetate, alkaline pH; a screening test for sickling red blood cells) in the hematology sector of the Clinical Analysis Laboratory of HU/UFMS.[7]

The pregnant women with confirmed diagnoses of hemoglobinopathies were assisted by the health professionals during prenatal care, including the biochemist, the nurse, and the hematologist. The guidelines involved since those considered as common during pregnancy to those regarding the detected abnormal hemoglobin and what it poses to their offspring. The importance of having an adequate prenatal care was stressed for the pregnant woman, in order to prevent complications leading to morbimortality of both the pregnant woman and fetus.

Data were analyzed through descriptive statistics and presented into tables, with absolute and relative frequencies.

RESULTS

Having the form applied as a basis, responses related to age, ethnic group, schooling, descent, and birthplace were obtained (Table 1), highlighting: 20% of pregnant adolescents; 36.3% without education, with complete or incomplete primary education; 53% non-Caucasian; 43.3% born in Campo Grande; and 21.1% with European descent.

Table 1. Number and percentage of pregnant women analyzed, according to study variables, HU/UFMS – 2007 (n = 215)

Variables	n	%
Age		
From 14 to 19 years	43	20.0
From 20 years	172	80.0
Ethnic group		
Non-Caucasian	114	53.0
Caucasian	101	47.0
Schooling		
Complete or incomplete primary education or without education	78	36.3
Complete or incomplete high school	110	51.2
Complete or incomplete higher education	27	12.5
Descent[1]		
No information	114	53.0
European	47	21.9
South American	45	20.9
African	17	7.9
Birthplace		
Campo Grande, Mato Grosso do Sul	93	43.3
Countryside of Mato Grosso do Sul	62	28.8
Other states	60	27.9

[1] Each pregnant woman could indicate one or more descents.

In the evaluation of anemia, it was found that, of the 215 pregnant women analyzed, 38 (17.7%) had anemia. Regarding the detected hemoglobinopathies, there were 10 (4.7%) heterozygous carriers of abnormal hemoglobin. The genotypes observed – HbAA, HbAS, HbAC and β-thalassemia –, as well as its frequency, are indicated in Table 2. Of the 215 pregnant women, there were 7 (3.3%) with sickle traits or HbAS, 2 (0.9%) HBAC carriers, and 1 (0.5%) with intermediate β-thalassemia. Ten pregnant women were carriers of hemoglobinopathies and anemia was also identified in two of them.

Table 2. Number and percentage of pregnant women analyzed, according to abnormal hemoglobin and hemoglobin types found, HU/UFMS – 2007 (n = 215)

Variables	n	%
Abnormal hemoglobin		
Absent	205	95.3
Present	10	4.7
Types		
HbAA	205	95.3
HbAS	7	3.3
HbAC B-thalassemia	2	0.9
Intermediate	1	0.5

DISCUSSION

The hereditary diseases can be controlled through prevention programs, which consist of detection of carriers, treatment of patients, and genetic counseling. These programs are well accepted by pregnant women, because, at that stage, they underwent monitoring during pregnancy, constant clinical and laboratory evaluations and, therefore, they are more likely to take care of their health and their children's health.[8-10]

The frequency of heterozygotes, for abnormal hemoglobin, observed among pregnant women participating in this study, complement other studies carried out in the State of Mato Grosso do Sul, confirming the relevance of abnormal hemoglobin to public health in this region.[11-13]

In this study, 17.7% of pregnant women had some type of anemia. This percentage was inferior to the alarming rate considered by the World Health Organization (WHO), which is equal to or greater than 40%. However, the ideal prevalence values are below 5%.[14] Thus, the result found demonstrates the need for measures to fight anemia during prenatal care held in HU/UFMS, which is a public hospital and he most preferred hospital by the poor population. In Brazil, the available data show that the prevalence of anemia varies from 12.4% to 54.7%, depending on gestational age, the socioeconomic status, and the region.[15]

The prevalence of hemoglobinopathies in Brazil varies from 2% to 10%, depending on the region analyzed.[16] A study carried out in the country, for the detection of hemoglobinopathies in pregnant women, revealed that the prevalence of abnormal hemoglobin ranges from 3.6% to 10.77%.[9]

The discrepancy between the prevalences

is due to the identification of α-thalassemia, through electrophoretic fractionation and cytological evaluation of intraeritrocitary HbH precipitates.[9] This test of intraeritrocitary HbH inclusion can result in false positives, thus disabling an adequate diagnosis of thalassemia.[17,18] Besides, people with HbH can have an acquired form.[10] Therefore, α-thalassemia is often diagnosed through the use of molecular biology techniques which also are not routinely available in the laboratories of many services.[19]

The presence of 3.3% of the sickle trait, in this investigation, was similar to that found in another study[12], concerning the general population of Campo Grande, which detected 3.15% of HbAS, as well as in researches carried out with pregnant women, 2.01%[9] and 2.4%.[17]

When discussing pregnancy in homozygous patients (sickle cell anemia), the risks are not large to contraindicate a desired pregnancy.[20] A study claims that the significant decrease in morbimortality verified in recent years, in these women, is due to a better understanding of the pathophysiology of the disease and the changes that occur during pregnancy, instead of blood transfusions as prophylaxis.[21]

In this study, we found 0.9% of pregnant women with heterozygous for HbC, while in other researches it was found 0.28%[9] and 0.4%.[17] About 1% of a mixed population from Southeastern Brazil is a HBAC carrier.[22]

It was also found 0.5% of intermediate ß-thalassemia through laboratory tests and clinical manifestations of one patient. By virtue of moderate severity, this pregnant woman received a multiprofessional follow-up and adequate treatment, including blood transfusions, when needed. Other studies identified 1.29% and 0.8% of pregnant women with minor ß-thalassemia. In Brazil, researches to detect ß-thalassemia are rare and specific to certain groups and there is no actual prevalence for each state.[9,27,23]

Until recently, pregnant women with major ß-thalassemia were rare, due to delayed sexual development and early death before the reproductive age. After the introduction of blood transfusion and iron chelation therapy, cases of pregnant women with major ß-thalassemia have been described. Pregnancy is a possibility for those with normal cardiac function, hemoglobin about 10 g/dL, and using an iron chelating agent. Fetal growth must be followed-up through ultrasonography. Pregnant women with minor ß-thalassemia are asymptomatic or they present a mild anemia.[10]

Regarding the profile detected through the form filled in, 20% of the pregnant women were between 10 and 19 years of age and they were considered pregnant adolescents, according to criteria from the Interagency Network of Health Information.[24] Adolescent pregnancy is a clinical problem, as it has a less constant medical care, and a social problem, as it interferes with the woman's life and her family's life.[25,26]

It was also revealed that 36.3% of the pregnant women had incomplete primary education, including the pregnant women considered as illiterate, that is, those with less than four years of study who, even having learned to decode short phrases, did not developed the ability to interpret texts.[26] There is, therefore, the need for a formal guidance of these functionally illiterate pregnant women, in order to improve the understanding of the detected anemia.[27]

Miscegenation was detected in the population under study, by means of the results regarding ethnic group, nationality, and descent, reflecting the colonization of Mato Grosso do Sul, which received German, Portuguese, Spanish, Paraguayan, Italian, Japanese, Lebanese and Syrian immigrants, as well as migrants from Minas Gerais, São Paulo, Rio Grande do Sul, and the Northeastern states.

CONCLUSION

Detecting the frequency of anemia in pregnant women was a pioneer survey in HU/UFMS which allowed an early estimation of this common hematologic disorder during pregnancy and enabled the various professionals of the health staff to provide an early intervention.

This study was important for the detection and guidance of asymptomatic heterozygotes and it favored the adequate clinical referral, when needed. Considering the demographic profile found and the fact that hemoglobinopathies and anemia, in general, have a high variability in the clinical manifestations, early and accurate diagnosis of anemia showed to be relevant in the treatment and follow-up of pregnant women during prenatal care. Furthermore, it turned an immediate intervention by the specific professional easier, through preventive and assistance actions, something which contributed to reduce maternal and neonatal morbimortality in the clientele surveyed.

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