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KIDNEY FUNCTIONS IN ANEMIA IN PREGNANT WOMEN

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Abstract:

A normal pregnancy places great demands on a woman's body. During pregnancy, big changes occur in the body. Every day, the developing fetus requires large energy expenditures from the mother's body, which can be satisfied with enormous efforts from various body systems, including the hematopoietic organs. During pregnancy, the blood picture changes significantly. The total number of red blood cells and hemoglobin increases by an average of 18-20% (A.A. Kadyrova , 1969; E.M. Feder , 1973). The need for vitamins, proteins, and microelements increases. Absorption of iron for the needs of the fetus and mother during pregnancy occurs 5-6 times faster. Anemia of pregnancy is quite common in obstetric practice and is one of the serious complications of pregnancy, childbirth and the postpartum period. Anemia in pregnant women is quite often combined with extragenital pathology, which in turn affects the frequency and amount of blood loss during childbirth according to data from pregnant women at different stages of pregnancy. The studies were conducted upon admission to the hospital, during treatment and before discharge from the hospital

Keywords: anemia, pregnancy, kidney disfunction, postpartum period, childbirth

INTRODUCTION. It is estimated that 1:150 women of childbearing age have stage 3–5 chronic kidney disease (CKD), though reduced fertility and an increased rate of early miscarriage results in lower fertility rates in this group.[1] The World Health Organization (WHO) defines anemia in pregnancy as a hemoglobin (Hb) less than 110 g/L in first and third trimesters, though it is recognized that Hb concentrations fall by approximately 5 g/L in second trimester.[2] The lower limit of normal for Hb concentration however may vary in different populations. The Kidney Health Australia – Caring for Australasians with Renal Impairment and National Institute for Health and Care Excellence guidelines for non-pregnant adults with CKD recommend a target Hb of 100–115 g/L and 100–120 g/L respectively.[3,4] The ideal level for Hb in CKD pregnancy is not known.[3,5] Between 1990 and 2016, the prevalence of anemia complicating all pregnancies in Australia fell from 29.4% to 20.1%; however, maternal anemia has been found in up to half of pregnant Aboriginal and Torres Strait Islander women in Far North Queensland and the Remote Northern Territory.[6,7] A recent Australian study reported that 47% of CKD pregnancies were complicated by anemia, although the level of Hb defining anemia was not stated.[8] In non-pregnant CKD individuals, iron replacement is indicated with serum ferritin less than 100 ug/L and/or transferrin saturation less than 20%.[9] Guidelines regarding the levels of ferritin indicating the need for iron replacement in healthy pregnancy vary widely: less than15 ug/L (WHO), less than 30 ug/L (United Kingdom) and less than 70 ug/L (Denmark).[10] It is recommended that erythropoiesis stimulating agents (ESA) should not be initiated until iron deficiency is corrected.[11]

Maternal anemia in pregnancy is associated with increased rates of preterm birth, low birthweight, placental abruption, preeclampsia (PET) and postpartum haemorrhage.[12–18] Hb less than 70 g/L is associated with increased risk of maternal death (aOR: 2.36).[19] Additional maternal effects with anemia in pregnancy include increased susceptibility to infection, increased likelihood of blood transfusion and greater risk of postpartum depression.[16] Adverse fetal outcomes of maternal anemia include delayed growth and development, impaired psychomotor and mental development, increased risk of cognitive and behavior abnormalities and increased perinatal and neonatal mortality.[20,21] Iron deficiency anemia in late pregnancy is associated with abnormal neonatal auditory maturation.[22] Systematic reviews of oral and intravenous iron (FeI) therapy for iron deficiency anemia demonstrate improvement in hematological parameters though no improvement in clinically relevant outcomes.[23]

MATERIALS AND METHODS. The pregnant women we examined were aged 20-40 years, among them were primiparous - 3, multiparous - 17. Menstrual function in

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all women was not impaired. A detailed study of the patients' anamnesis revealed that in the past, most of them had suffered from viral influenza, hepatitis, and suffered from frequent bleeding, which, apparently, contributed to a decrease in the general resistance of the body and created a favorable background for the occurrence of anemia.

RESULTS. When studying the obstetric history, attention is drawn to the presence of 2 or more spontaneous and induced abortions in the majority of women, in 8 women previous pregnancies were accompanied by anemia, in 3 there were early and late toxicoses of pregnancy, in 3 there was bleeding during childbirth, in one woman pregnancy was complicated by premature detachment of the normally attached placenta, and therefore a cesarean section was performed. These complications could create the preconditions for the occurrence of anemia during this pregnancy. We have studied the dynamics of blood and urine patterns, urea and residual nitrogen, acid-base balance, hematocrit, diastasis, blood creatinine, blood potassium and sodium. To judge renal function, daily diuresis and Zimnitsky tests were additionally studied in all subjects . Blood hemoglobin is determined by Sally's hemometer. According to the degree of anemia, depending on the hemoglobin content, patients were distributed as follows: 1st degree - 7 women, 2nd degree - 6 women, 3rd degree - 7 women. Blood creatinine in all women ranged from 1.1 ml% to 1.5 ml%, while the normal blood creatinine content according to Jaffa is I.0I.6 µml . When examining urine, it was found that the specific gravity ranged from I006 to I020, in patient 1 there was 0.66% protein in the urine, in patient 3 there was leukocyturia , y. I - bacteriuria. The urea level reached 24-64 mg% (normally 20-30 mg%). A moderate violation of blood urea levels is indicated by renal function. According to A.A. Kadyrova (I969), A.V. Mustyatse (I973), anemia occurs in 15-30% of pregnant women. Moreover, iron deficiency anemia accounts for 10-95% of all anemias. Anemia disrupts all types of metabolism and creates conditions for the development of other obstetric pathologies. One of the most serious complications is oxygen starvation. A decrease in the amount of hemoglobin in the blood leads to disruption of oxygen transport in tissues, which worsens metabolic disorders characteristic of normal pregnancy. Therefore, a change occurs in the oxidation -reduction processes not only in the mother, but also in the fetus. T.R. Zakharova (1975) found that, in turn, leads to disruption of the excretory function of the kidneys up to the development of renal failure. There is now an extensive literature on renal function in normal pregnancies. At the same time, kidney function in anemia of pregnant women remains poorly understood. In this regard, we examined 20 pregnant women. The level of residual nitrogen in the blood ranged from 29 to 38 mg%. The kidneys play a major role in the exchange of electrolytes. We determined the content of K and K in the blood using flame photometry. It was revealed that in all patients the level was from 130 to 173 mgA . The decrease in the blood can be explained by the fact that tubular reabsorption processes are inhibited . The level of K in the blood plasma in the patients we examined ranged from 3.1 to 6.1 mmol/l. The hematocrit ranged from 30 to 50% (normally its level should not exceed 37-47%). Diastasis in the examined patients ranged from 16 to 32 units. It is known that during pregnancy physiological changes occur in all organs and systems, including changes in the acid-base balance. The women we examined revealed the presence of compensated acidosis. This is expressed in an increase in under-oxidized metabolic products: BE = + 4.5 meq/l (in + 2.5 meq /l); BB = + 44-59 mzkv /l; FCO , - from 31 to 59 ml Hg ; 2 PO , - 134 ml Hg ; a pH shift to the acidic side was not observed... All examined patients received antianemic treatment, which included blood transfusion depending on the degree of anemia. After treatment, the patients were examined again.

CONCLUSION. Greater awareness of the importance of regular measurement of iron stores and appropriate levels for repletion in chronic kidney disease pregnancies amongst health professionals involved in obstetric care may result in earlier detection and treatment of iron deficiency, and potentially improve maternal and fetal outcomes.

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