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KIDNEY DISEASES IN WOMEN OF REPRODUCTIVE AGE AGAINST THE BACKGROUND OF PHYSIOLOGICAL PREGNANCY

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REZUME

With an uncomplicated pregnancy in a woman's body, a number of adaptive and adaptive processes develop (hypervolemia, fluid accumulation, changes in the content of electrolytes and non-electrolytes), in which the kidneys are directly involved. On the other hand, the appearance of uteroplacental blood circulation, an increase in regional hemodynamics during pregnancy cannot but affect the functional state of the kidneys of a pregnant woman.

During physiological pregnancy, specific changes in kidney function occur, aimed at ensuring the normal process of gestation. However, ultrasound studies of the kidneys using intravital biopsy did not reveal any significant changes in the structure of the parenchyma.

Key words: hypervolemia, fluid accumulation, changes in the content of electrolytes and non-electrolytes

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Introduction. In uncomplicated pregnancy, a number of adaptive processes develop in a woman's body (hypervolemia, fluid accumulation, and changes in electrolyte and non-electrolyte content) in which the kidneys are directly involved as proved by an ultrasound examination. On the other hand, the emergence of uterine-placental circulation and the increase in regional hemodynamics during pregnancy cannot but affect the functional state of the pregnant woman's kidneys.

In physiological pregnancy there are specific changes in renal function aimed at ensuring a normal gestational process. However, ultrasound and renal morphological examination by intravital biopsy did not reveal any significant changes in the renal parenchyma structure.

Purpose of the study: current issues of COVID-19 prevention and investigation of kidney status in women of reproductive age in uncomplicated pregnancy.

A normal pregnancy is characterized by marked anatomical and morphological changes in the urinary tract and kidneys. According to the data available in the literature, as a result of significant neurohumoral, hormonal and mechanical effects the size of the kidneys increase and the urinary tract becomes enlarged. Dilation of the calyx-lobule system and ureter" begins in the first trimester of physiological pregnancy and achieves its maximum in the 5th and 8th months, remaining during 12-14 weeks after labour. The dilated calycolonoventricular system collects up to 150 ml or more of "residual urine".

Materials and Methods: As shown by morphological and ultrasonic studies, the kidney is normally 7.5-12 cm long, 4.5-6.5 cm wide and 3.5-5 cm thick. The difference in length between the two kidneys should not exceed 1.5-2 cm. Ultrasound investigation of 24 healthy non-pregnant women using the formula of ellipse, parenchyma and calyx-pelvis system revealed the following regularities: the left kidney volume was greater than the right by an average of 11.73 cm3 or 8.5% and was 138.12±17.31 cm3. This regularity was determined by the greater volume of the left kidney parenchyma. In 20 women with uncomplicated pregnancy, the study revealed that there was no increase in renal parenchyma volume by 12 weeks' gestation, whereas parenchyma volume increased significantly, more on the right (18.4 and 10.8%, respectively),

It was also found that the increase in the parenchyma was mainly due to its thickness. The volume of the parenchyma and the total volume of the kidneys continued to increase in the second trimester of pregnancy. However, by 24 weeks, a significantly larger volume of the calyx-pelvis system and the total volume of the kidney on the right side are found. The third trimester, the predominant right-sided increase in total renal volume (mainly due to increased volume of calyx-pelvic fluid system), which reaches a maximum at 36 weeks of gestation and persists until delivery.

A renal pelvis diameter of 3.4 mm to the right and 5.0 mm to the left in healthy non-pregnant women is also used to determine the extent of enlargement of the calyx-pelvis system. During uncomplicated pregnancy there is a progressive, predominantly right-sided increase in renal pelvis diameter from 5.0 mm in the first trimester to 10 and 12 mm in the right and third trimesters and from 3 mm to 4 and 6 mm on the left. An increase in the diameter of the pelvis over 17 mm in pregnancy is considered pathological. Interestingly, in some cases hydronephrotic renal transformation in pregnancy is asymptomatic. It should be regarded as a risk factor for pyelonephritis,

which aggravates its course and contributes to significant impairment of renal function. However, pelvic diameter measurement is considered by some authors to be not accurate enough due to a wide variability of pelvic dimensions depending on drinking regime, time of the day etc.

Discussion of the study materials: The peculiarity of renal blood flow during pregnancy is its increase in the first trimester and gradual decrease thereafter. The increase in renal blood flow in the early terms can reach 30-50% compared with that in non-pregnant women and by the end of pregnancy it can be even lower than that in non-pregnant women. Thus, according to M. M. Shehtman data, healthy non-pregnant women have a renal blood flow of 1100 ml/min at the average. In the first trimester of pregnancy it increases to 1460 ml/min; in the II and III trimesters it decreases to 1150 and 1050 ml/min respectively. Renal blood flow decreases to 820 ml/min in the last 3 weeks before labour.

Literature data on the status of tubal reabsorption are contradictory. Some suggest that it does not change with gestational progression, whilst others report a decrease.

Water-salt metabolism undergoes significant changes during pregnancy: the total body water content increases due to the accumulation of extracellular fluid in blood vessels and interstitial space. The amount of fluid in the pregnant woman's organism may increase by 7 litres, and the amount of water contained in the fetus, placenta, amniotic fluid, uterus, urinary glands, mother's blood is 5.8 litres.

Potassium plays an essential role in electrolyte metabolism. This cation is located inside the cell. During pregnancy, the amount of potassium increases by 30% compared to non-pregnant women. The increase in plasma concentration of this cation in uncomplicated pregnancy and decrease of its excretion in the urine have been demonstrated by several researchers.

A number of women with uncomplicated pregnancy may have glycosuria, often in the first half of pregnancy. Glycosuria in pregnant women is caused by an increase in glucose glucose glucose glucose glucose filtration in excess of maximum reabsorption by tubules, as tubular reabsorption either remains unchanged or decreases slightly.

The kidneys are involved in homeostasis maintenance not only due to their excretory function, but also due to very important metabolic activity of the tubular epithelium cells. The latter is related not only to the mechanisms of tubular transport, but also to the synthesis of hormones, low-molecular-weight proteins and peptides decomposition, as well as to metabolic transformations aimed at regulating body fluid composition.

In uncomplicated pregnancy, as pregnancy progresses, there is increased activity of the kyllicrein-kinin system. Its activation as well as that of the renin-aldosterone system in pregnancy is necessary to maintain vascular tone under increased circulating blood volume and to ensure adequate uterine-placental circulation.

A direct correlation between renal function and the state of the foeto-placental system has been detected. The literature suggests an increased velocity of blood flow in the renal and uterine arteries during physiological pregnancy; the velocity of blood flow in the uterine arteries is higher than in the renal ones. There is also evidence of correlation between changes in the blood flow in the uterine arteries and functional state of the kidneys during pregnancy: an increase in systolic-diastolic ratio over 2.8, which reflects the resistance of the peripheral vascular bed, is followed by a decrease in endogenous creatinine clearance to 87+2.3 ml/min versus 114±3.2 ml/min for systolic-diastolic coefficient values below 2.6.

Conclusions: The literature data suggest that uncomplicated pregnancy results in a whole complex of adaptive-adaptive changes in renal function; this complex is aimed at ensuring an adequate course of the gestational process, fetal growth and development. In uncomplicated pregnancy there are significant changes in renal blood supply. Renal blood flow during pregnancy depends on both changes in circulatory conditions in the kidneys themselves and in general hemodynamics. However, there is no direct correlation between renal blood flow and the main parameters of general hemodynamics (minute volume and circulating blood volume).

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