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Abstract of the PhD thesis:

STUDY OF ULTRASONIC ASSESSMENT OF THE UTERUS IN THE PUERPERIUM

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Introduction: The puerperium is the period following childbirth, lasting 6 weeks, characterized by the regression of the genital morpho-functional modifications occurred during pregnancy. At the end of this period the genital system returns to its normal size and morpho-functional parameters as before the pregnancy.

Objectives: The aim of our study consists of the follow up of the uterine dimension, the content of the uterine cavity respectively the flowmetric indices (pulsatility and resistance index, protodiastolic notch persistence) during the puerperal period and also their long term development in order to understand better the physiology and pathology of the puerperium. The knowledge of the normal uterine ultrasonic appearance during the whole period of the puerperium improves our ability to distinguish the puerperal pathology from normal conditions and by this way to avoid the unnecessary invasive procedures.

Design and methods: The research had been effectuated on a study:

1. a retrospective study of the births registered at the Obstetrics and Gynecology Clinics I from Tirgu Mures, between January 1st 2008 – December 31st 2011 (in all 8407 births), respectively of the births with hemorrhagic complications (1244 births) selected from the entire number of births, searching for the correlations between the possible risk factors and hemorrhagic complications;

2. ultrasonic examination of the puerperal women with physiological and pathological puerperium;

3. Doppler ultrasonographic examination of the puerperal women with physiological and pathological puerperium.

In the group of puerperal woman with physiological puerperium there have been included 205 women and in that one with pathological puerperium there have been included 41 women with postpartum endometritis, 65 women after manual evacuation of the placenta, 70 puerperal women after cesarean section to whom ultrasound examination had been effectuated during the entire period of puerperium, respectively 76 women in which cases after the ultrasonographic screening made on the 3-5 days of the puerperium it has raised the suspicion of retained placental tissue. To all of these women it had been effectuated the surgical evacuation of the uterine cavity, the extracted material has been sent for histopathological examination.

Results: The study of births with hemorrhagic complications shows that 14.8% of birth is being complicated with bleeding during delivery or immediately in postpartum. The adherent placenta is the main cause of bleeding during delivery, in a rate of 79%, which represents 20.9% of the hemorrhagic complications of births with the following risk factors: maternal age between 26-34, 35-40; more than 4 pregnancies; parity over 3; the gestational age at birth <32 weeks and between 33-35 weeks; the groups of newborns weight 1001-1500g, respectively 1501-2500g; associated pathologies with pregnancies: fibroid and cicatricial uterus. In primary postpartum bleedings the main causes are the placenta remains (in 78.0%) and uterine hypotonia (in 18.9%). Regarding to the results of our study the risk factors for the primary postpartum bleedings are: for the placenta remains: twins births, primiparity, the gestational age <32 weeks and between 33-35 weeks, weight groups < 800 g, 801-1000 g, 1001-1500g and 1501-2500g, and for the uterine hypotonia: oxytocin perfusion oriented labor for primary uterine inertia and group of birth weight of newborns between 3501-4000g and > 4000 g.

The results of ultrasonic examinations of the patients with physiological puerperium shows a continuous decrease of the uterine AP diameter during the entire period of puerperium but the medium AP diameter of the uterine cavity after an initial decrease gradually increases on 5, 7 days of puerperium probably due to the necrotic retained decidua, after all it decreases continuously due to the slow involution of the placental plaque. The morphological findings of the uterine cavity in physiological puerperium have shown uterine vacuity in 93.2% in the first 3 days of the puerperium, probably induced by the heavy uterine contractions, in 37.6% an abundant uterine contain on the 5-7th days, respectively in 90.2% due to the presence of the necrotic decidua. In most cases of the puerperal women the analysis of the uterine position presented a retroversion in the first 3 days of the puerperium – 94.6%, respectively 87.3%, this position gradually changing till to the end of puerperium with the uterine anteversion dominance in 88.3% on the 42nd day. The flowmetric indices haven't changed considerable during the postpartum comparing with the first day of puerperium. The frequency of protodiastolic notch persistence grows with the puerperium evolution from 14.1% of cases in first day of puerperium and at the end of the second week achieves 27.3%, after this it increases more accented reaching 91.2% at the end of the puerperal period.

In the case of pathological puerperium during the analyse of the uterine involution there have been noted as all the three groups with pathological puerperium the process of involution have overlapped considerably with the reference values, in this way on the 42nd day of puerperium the uterus would achieve almost the same dimensions as in the reference population. Women with the placenta remains suspicion the measurement of the resistance index values in uterine arteries has the aim of comparing the precision of this diagnostic method based only on measuring the flowmetric values with other diagnostic methods, like the hyperechogenic image on the ultrasonic examination, respectively the vascular drawing image emphasized on Doppler ultrasonography. In the case of groups with placenta remains suspicion there haven't been noted the reappearance of the protodiastolic notches.

Conclusions: The postpartum hemorrhage represents a main cause of maternal morbidity. The adherent placenta is the main cause of bleeding in the case of hemorrhage during delivery and the placenta remains and uterine hypotonia in the primary postpartum hemorrhage. The prevention of postpartum hemorrhage becomes possible with searching and identifying the risk factors.

The ultrasonography is a non-invasive investigation useful in follow up the puerperal women during the entire period of puerperium. The ultrasonic examination of the uterine dimension and of the uterine cavity, the evaluation of the morphological modifications of the uterine cavity content permit the follow up of the uterine involution.

The pulsatility and resistance index together with the protodiastolic notch persistence reflect the hemodynamic modifications during the puerperium. Doppler ultrasonography through the flowmetric parameters permits the evaluation of cases with placenta remains suspicion and it can be used the screening of puerperal women in order to avoid the unnecessary invasive procedures.

Key words: puerperium, postpartum hemorrhage, ultrasonic examination, Doppler ultrasonography, flowmetric indices, retained placental tissue