

**Goshovska A.V.***Higher State Educational Establishment of Ukraine «Bukovinian State Medical University», Department of Obstetrics, Gynecology and Perinatology***Goshovskyi V.M.***Deputy Head Doctor, Maternity Home № 1, Chernivtsi*

## ULTRASOUND PARAMETERS OF EXTRAEMBRYONIC STRUCTURES IN THE PERIOD OF PLACENTAL COMPLEX FORMATION IN WOMEN AGAINST THE GROUND OF INFLAMMATORY DISEASES OF THE FEMALE REPRODUCTIVE ORGANS

**Abstract** Examination of extra-embryonic structures in women with infections of the reproductive organs is a topical diagnostic method in the development of primary placental dysfunction. To determine extra-embryonic structures in the period of placental complex formation in women against the ground of inflammatory diseases of the female reproductive organs. According to the assigned purpose ultrasound examination of 67 women was conducted in the period of the 6-7th and 12-14th weeks of gestation. The main group included 37 women with the signs of inflammatory diseases of the female reproductive organs, and the control group included 30 practically healthy women. Investigation of the sizes, structures and shape of the yolk sac, yellow body, chorionic, amniotic membranes, localization of the chorion will enable not only to predict gestational complications during I trimester of pregnancy, but to form placental dysfunction development in women against the ground of inflammatory diseases of the female reproductive organs. The registered echographic defects of the extra-embryonic structures are indicative of a careful observation and dynamic management of this group of women during II and III trimesters of pregnancy.

**Key words:** female, reproductive organs, placental complex.

**Introduction.** Placental dysfunction (PD) is one of the most important issues of modern obstetrics and perinatology. It takes one of the leading places among the causes of perinatal sickness and mortality. According to the results of current studies 20-60% cases of perinatal mortality are directly associated with placental pathology. Primary PD is manifested by disorders of the placental anatomical structure and considerable changes of its function at the stage of placental complex formation.

Timely diagnostics of the pathology and prognosis of its development play the most important role in occurrence of PD. Therefore, examination of extra-embryonic structures in women with infections of the reproductive organs is a topical diagnostic method in the development of primary placental dysfunction.

**Objective:** to determine extra-embryonic structures in the period of placental complex formation in women against the ground of inflammatory diseases of the female reproductive organs.

**Materials and methods.** By means of the ultrasound apparatus «Voluson Expert 730», with the purpose to obtain a volumetric image of the chorion, a three dimensional echography is made. A volumetric reconstruction of the chorionic blood flow was made in the program VOCAL (Virtual Organ Computer-Aided Analysis) with creation of the vascular component histogram in the specified volume of the chorionic tissue. Echographic parameters of the extra-embryonic structures were determined (the volume of the yolk sac, yellow body, chorionic, amniotic cavities, localization of the chorion and yellow body) in women of the main and control groups in the period of the 6-7<sup>th</sup> and 12-14<sup>th</sup> weeks of gestation.

According to the assigned purpose ultrasound examination of 67 women was conducted in the period of the 6-7<sup>th</sup> and 12-14<sup>th</sup> weeks of gestation. The main group included 37 women with the signs of inflammatory diseases of the female reproductive organs, and the control group included 30 practically healthy women.

**Results.** Ultrasound diagnostics (USD) of

women from the main group determined peculiar features of the localization of the chorion, placenta, dilation of the intervillous space (IVS) and alternative changes: availability of infarctions, pseudoinfarctions, increased amount of calcifications, petrifications, changes of thickness and disorders in placental maturation terms.

To diagnose the yolk sac (intra-embryonic structure performing nutritious, hematopoietic functions in the first days of gestation) the location, shape, sizes of the middle internal diameter (MID) of the yolk sac were determined in the women of the examined groups (Table 1). The diameter of the yolk sac in women from the control group was found to be more than 10 mm (in the term of more than 5 weeks), in the shape of a white ring about 12 mm of diameter (6-7 weeks), about 17 mm (10-12 weeks). It should be noted that in the majority of women from the main group 21 (56,7%) thinning of the yolk sac diameter in the term of 6-7 weeks of gestation was found reaching 5-6 mm in 29 (78,4%) women, in the term of 10-11 weeks - 8,5 mm in 26 (70,5%) women, and in the term of 12-14 weeks of gestation – 10 mm in 29 (78,4%) women.

Table

**Size of the yolk sac in women of the examined groups**

Term of pregnancy	Size of the yolk sac (main group n = 37)	Size of the yolk sac (control group n = 30)
5-6 weeks	5 mm	11-12 mm
6-7 weeks	5-6 mm	12-13 mm
7-8 weeks	6-7,5 mm	13-14 mm
8-9 weeks	7,5-8 mm	14-15 mm
9-10 weeks	8 mm	15-16 mm
10-11 weeks	8,5 mm	16-17 mm
11-12 weeks	8,5-9 mm	17-18 mm
12 weeks	10 mm	18-19 mm

The diagnostics of the yolk sac shape determined that in women from the control group a round shape was fixed in 26 (86,7%) and an oval one – in 4 (13,3%), while in women from the main group deformity of the yolk sac was found in 31 (88,6%) cases in the form of bundle roller, crescent, and double oval. The changes found in deformity of the yolk sac in the majority of women from the main group were indicative of a high risk

of miscarriage threat in I trimester of gestation and formation of primary placental dysfunction against the ground of inflammatory diseases of the female reproductive organs.

In much later terms of gestation in women from the control group the yolk sac had a tendency to decomposition and was not visualized on the screen. Though in women from the main group 21 (60%) decomposition of the yolk sac occurred much earlier (up to 10 weeks of gestation). Preterm decomposition of the yolk sac in women from the main group was indicative of the fact that the embryo discontinued to get essential substances for its development, the synthesis of hormones and enzymes was disturbed resulting in intrauterine death of the embryo and spontaneous miscarriage.

USD results in the 7-9<sup>th</sup> weeks of gestation were indicative of the fact that volumes of amniotic cavity and ovum in women from the examined groups differed reliably. It should be noted that women from the main group developed polyhydroamnion with the signs of hydramnion (the main group – 9,8 cm<sup>3</sup>, the control group – 6,1 cm<sup>3</sup>), which is associated with affliction of the amniotic membrane by a specific causative agent. Meanwhile, the volume of the ovum cavity was reliably smaller in women from the main group (14 cm<sup>3</sup>) compared to that of the control (20 cm<sup>3</sup>). Chorionic hypoplasia in women from the main group was found in 63,4% cases, which was characterized by lagging of its thickness more than 5 mm compared to the women from the control group. At the same time, the correlation in volumes of the chorionic and amniotic cavities in the control group of the examined women was reliably higher (6,2) in comparison with the main data (2,9). It should be noted that in women from the main group the content of the chorionic and amniotic cavities possessed different echogenicity. In case of primary infection resulting from pronounced proliferative-exudative reaction of the amniotic membrane and yolk sac increased echogenicity of the indicated cavities occurred in women from the main group. Enlarged volume of the amnion, decreased chorion and deformity of the ovum in women from the main group are caused by penetration and affliction of a specific causative agent and intensified myometrium tonus. Due to

this fact the ovum experiences external increased pressure.

Detection of the chorion localization diagnosed presentation of the winding chorion in 15 (42,8%) women from the main group, or it blocks the region of the internal eye; but none of the case was diagnosed among women from the control group. Low location of the ovum was found in 19 (54,3%) women from the main group and 2 (6,6%) from the control group. Fragmentary chorion was determined in 12 (34,3%) women from the main group with visualization of unechogenic structure of an irregular form 5-10 mm in size. Retrochorionic hematoma was diagnosed in 16 (45,7%) pregnant women from the main group and 1 (3,3%) woman from the control group.

Echographic examination of the ovaries in women from both main and control groups paid special attention to determination of the diameter and echostructure of the yellow body. It should be noted that yellow body in women from the control group looked like a simple, thin-walled or complicated cyst with hyperechogenic formation. The diameter of the yellow body in women from the control group was diagnosed to be 2-3 cm, while in the majority of women from the main group the diameter of the yellow body was 0,5-1,5 cm in 84,5% of cases, and in 15,5% of cases the yellow body was not found or was under 0,5 cm in diameter. This objective sign enabled to predict a high percentage of spontaneous miscarriage threat.

**Conclusions.** Therefore, it should be noted that at the early terms of pregnancy in addition to examination of the embryo and assessment of its development the study of extra-embryonic

structures of the ovum deserves consideration. Investigation of the sizes, structures and shape of the yolk sac, yellow body, chorionic, amniotic membranes, localization of the chorion will enable not only to predict gestational complications during I trimester of pregnancy, but to form placental dysfunction development in women against the ground of inflammatory diseases of the female reproductive organs. The registered echographic defects of the extra-embryonic structures are indicative of a careful observation and dynamic management of this group of women during II and III trimesters of pregnancy.

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