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ULTRASOUND IN THE FIRST TRIMESTER OF PREGNANCY. PERSONAL EXPERIENCE AND REVIEW OF THE LITERATURE.

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Abstract

The important development of fetal medicine has in recent years allowed important information about the fetus and, implicitly, the prospects of pregnancy can be gathered and interpreted since the first quarter, that we really can talk about overcoming the pregnancy monitoring pyramid described by Professor Nikolaides - the head of the fetal medicine foundation. A good outcome of the first trimester screening is a strong evidence of fetal normality, while a positive outcome involves subsequent investigations of aneuploidy or specific conduct for morphological abnormalities.

Key words: *Ultrasound, aneuploidy, morphological anomalies, chorionic villus sampling.*

INTRODUCTION

Fetal ultrasound is performed between 11 and 13 weeks and 6 days, the optimal period for achieving it because over 11 weeks gestational age becomes ultrasound visual details of the fetal anatomy needed to confirm or refute morphological abnormalities. It is the period during which aneuploidy integrated calculation can be performed, diagnosis (biopsy of corial villitis) can be performed in case of suspected screening test. (Levi, Lyons, Lindsay, 1990)

Chorionic villus sampling (CVS) cannot be performed at a gestational age of less than 11 weeks because it could generate abnormalities of microglia and limb microglia but no more than 13 weeks and 6 days because the liquid collection in the back of the baby's neck (nuchal translucency) decreases after week 14 and fetal verticalization occurs in the uterine cavity making it difficult to perform the measurements. (Akolekar et al., 2015)

MATERIAL AND METHOD

First-trimester fetal ultrasound follows:

A Demonstration of the viability of the pregnancy by proving the presence of fetal heart rate (FHR) - practicing a transversal or median longitudinal section and applying the calipers to the fetal heart. The frequency of the fetal heart rate being one of the important parameters is included in the risk calculation for aneuploidy. The normal measured value is 110 beats per minute for 5 gestational weeks, 170 beats per minute for 10 weeks gestation and 150 beats / minute at week 14. (Kagan et al., 2008)

B Determining the age of pregnancy and establishing the birth term by measuring Crown-rump length (CRL). The CRL's correct measurements are: - fitting in a horizontal position, enlarging the image so that the whole screen is occupied with the head of the chest and the fetal abdomen, is in a neutral position (there is an amniotic fluid bag between the chin and the thorax of the fetus), the calipers being positioned on the cranial head and the most deciduous point of the caudal fetal trunk. (Abdallah et al., 2011)

C Determination of the number of embryos of chorionicity and amnionicity at multiple pregnancy, the determinant factor in the pathology of these pregnancies being chorionicity, monocortical tasks having the highest percentage of complications (abortion, perinatal mortality, abnormalities, preterm birth) compared to single and multiple birth pregnancies. The determination of the chorionicity can be done on the occasion of an ultrasound carried out as early as the pregnancy, establishing the insertion of the membranes into the placenta. In the case of insertion into T (membranes perpendicular to the placenta) it is a monochorial task while the image in Lambda (between the amniotic layers there is a mass of chorial tissue) is characteristic for bicorinary geminary tasks. (Skiadas et al., 2011).

D Performing the fetal morphology of the first trimester. Fetal morphological abnormalities occur in 3-5% of the pregnancies, and making this ultrasound has some major advantages - detecting major anomalies by screening their confirmation by performing placental tissue biopsy and the possibility of giving up pregnancy for fetal anomaly (TOPFA) in the first trimester when this workmanship is easier to accomplish, and reduced complications. Fetal morphological abnormalities in the first trimester may be: Always detectable - Existent and always visible in the first trimester, potentially detectable in the first trimester but more difficult to detect their detection depending on the time allocated to the ultrasound examination of the examiner, the quality of the device, undetectable abnormalities which become viewable in Q2 or Q3. (Campagnoli et. Al., 2001)

RESULTS AND DISCUSSIONS

In the first trimester ultrasound, the following structures must be demonstrated: the fetal head is visualized on medium and transverse sagittal

sections with a regular oval shape without depressions or hiatuses in normal calcified contours. In the first trimester of pregnancy, the butterfly sign – anechogenic lateral cerebral ventricles containing the choroid plexuses in the 2/3 posterior, cerebral cortex on the margins, median continuous falx cereb. They can also visualize the cerebral trunk and ventricle IV. (Akmal et al. 2002)

Cranial pathology always detectable: acrania, exencephalia, anencephaly, in this sequence only after 11 weeks gestation when the ossification of the skull is complete. Holoprosencephalic alobar or semilobar occurs due to incomplete scarring on the medial line of brain structures with thalamus fusion and lateral ventricles occurring in 60% of the cases associated with trisomy 13. Cephalocele is the protrusion of the brain substance (meninges and / or cerebral mass) through a defect bone in the cranial contour and is localized by the occipital rule. (Irurita, 2015)

Potentially detectable cranial pathology in the first trimester includes posterior cerebral palsy abnormalities - Dandy Walker syndrome suspected of elevated intracranial translucency, but can be confirmed only in the second trimester of pregnancy when the formation of calves and cerebellum vermin is finalized. Ventriculomegaly occurs in congenital infections, the malformations of the ultrasound image being of anechogenous lateral ventricles with very small dimensions of crown plexes. (McKechnie, Vasudevan, Levene, 2012) (Voiță et al., 2017)

The vertebral column is evaluated along with the overweight skin on a sagittal section in the first trimester and in 3D.

Pathology of the potentially detectable spine in this trimester is spina bifida susceptible to the reduction of intracranial translucency that suggests the caudal movement of the cerebral trunk. You can also see myelos or myelomeningoes of obvious bulky or angular column. (Chaoui, Nicolaides, 2010)

Fetal face is assessed on the sagittal and frontal section. The sagittal section evaluates the fetal profile accounting for: the forehead, the nasal bone, the palatal tongue, the mandibular lips, while the frontal section evaluates the orbits with the lens, the retro-nasal triangle and the upper lip. The potentially detectable anomalies at the face are represented by observable microgna only if it is severe and associated with trisomy 18 and defects of the upper lip and the palate expressed by the discontinuity or absence of the base of the retro-nasal triangle - very hard to demonstrate. (Paladini, 2010) (Mekereș et al., 2017)

The fetal face is evaluated on the average sagittal section and the cystic hygromy can be visualized.

Thorax and fetal cord is evaluated on the mean sagittal section and transversal sections. In the first trimester, cardiac evaluation together with

measurement of nuchal translucency, venous duct and tricuspid regurgitation can detect about 50% of major cardiac malformations. Normal chest imaging includes the two normal homogeneous echogenic lungs without hyper or hypoechogenic images. The cord should be evaluated against the stomach and diaphragm. It is necessary to demonstrate the 4-chamber image, emerging from the large vessels, the X sign (the aorta with the pulmonary artery) V sign (the aorta and the arterial duct). The detectable abnormality in the first trimester could be dextrocardia of the anomalous position in the ear could be real or in other malformations- diaphragmatic hernia or situs inversus. Potentially detectable would be a group of difficult cardiac abnormalities yet to be demonstrated in the first trimester of pregnancy and which for a definitive diagnosis should be reassessed in the second trimester after week 18.The most frequently may be suspected: ventricular, atrio-ventricular septal defect, Fallot tetralogy, hypoplastic left ventricle. (Biyyam et. al. 2010)

Fetal abdomen assesses the stomach, liver, anterior abdominal wall with the insertion of the umbilical cord on medium sagittal sections and cross sections. The detectable anomalies at this level are: the omphalocel a defect of the abdominal wall previously diagnosable only after the 11th week of pregnancy (until then being physiological) consisting of herniation of the small intestine and / or the liver at the level of the insertion of the cord in the fetal abdomen. (Mekereș et al., 2017)

It is frequently associated with 13 and 18 trisomy, especially when the contents are represented by the intestines, they can spontaneously remit or at birth, it is recommended to determine the fetal karyotype due to association with the mentioned trisomies. Gastroschizis represents the herniation of intestinal groins by a point to the right of an intact cord insertion. It is not associated with aneuploids and does not regress spontaneously. Hyperechogenic intestinal aneurysms may also be an indirect sign of trisomy. (Stoll et al., 2001)

Fetal urinary device can be demonstrated by the presence of the umbilical arteries (Doppler) and the kidneys-position, their appearance and the vascularization of the renal arteries in the aorta bilaterally are demonstrated. The always detectable anomalies are urinary magacystis when it is between 7-14 mm is associated with especially those trisomies 13 and 18, more than 15 mm, meaning urethral atresia and complete urethral valve syndrome. It can also demonstrate the more bulky kidney pielectasis. As well as potentially detectable abnormalities it is mentioned bilateral renal agenesis - the kidneys being difficult Viewed due to reduced echogenity. After gestational week 16 it can be diagnosed due to the present oligoamnios. (Sepulveda, 2004)

The assessment of the limbs is obligatory, observing their three segments, possibly the presence of fingers, limb movements and correct articulation of the segments. The potentially detectable anomalies would be the absence of a single member or membership segments, and varus equin strongly associated with trisomy 18, but harder demonstrable. (Kalampokas, 2012)

The ultrasound shows the position of placenta, the relationship with the cesarean post-operative scar or hematomas, it can evaluate uterus, cervix, and ovaries. (Mekereş, 2017).

Ultrasound plays a key role in choosing the place of puncture, optimal attraction to the placenta, monitors the movement of the needle within the placenta, and monitors the presence of fetal heart movements after the procedure is completed, thereby certifying the viability of the pregnancy.

CONCLUSIONS

First-trimester ultrasound is critical to monitoring pregnancies. It takes between 11 and 13 weeks and 6 days. Confirm or rule out numerous major morphological abnormalities and may perform integrated risk calculation.

The diagnosis of aneuploidy by chorionic villus sampling can be done with both the abdominal and endovaginal probes. Ultrasound allows the calculation of risk for major aneuploidy.

Fetal ultrasound allows the risk calculation for preterm birth, preeclampsia, intrauterine growth delay, and gathers decisive information about fetal morphology and pregnancy outlook through screening, diagnosis and intrauterine therapy.

Making a quality ultrasound requires a quality device, time, quality training of examiners and their annual auditing.

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