

# Relation of ECHO Doppler uterin in the first trimester to fetal SGA or IUGR

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## ABSTRACT

*The ECHO Doppler of the uterine artery is used to predict adverse pregnancy outcomes such as. pre-eclampsia and in the fetal SGA.*

**Objectives.** *Evaluation of the impact of ECHO Doppler uterine parameters in the first trimester, with the fetal SGA / IUGR.*

**Materials and method.** *The study is a prospective study conducted at the Special Gynecology Hospital "Mother Teresa", Skopje, and the Clinical-Biochemical Laboratory, Institute of Immunology at the University Clinical Center Skopje R, North Macedonia, and February 2018-September 2019. 698 pregnant women were included in the study.*

**Outcomes.** *Out of all controlled patients in the period February 2019-June 2010, a total of 698 pregnant women were studied. Increase in ECHO Doppler of uterine arteries.*

**Discussion.** *Assessment of placental development during pregnancy is one of the most important predictors of fetal development and pre-eclampsia. In modern acupuncture protocols, new diagnostic methods are of particular importance.*

**Conclusion.** *In our study, ECHO Doppler of uterine arteries resulted in: sensitivity 50%, specificity 50%, PPV 50%, NPV 50%.  $P = 0.5$   $R = 0.5$ . Confirming high reliability of ECHO Doppler uterine arteries in early detection of preeclampsia and its impact on the newborn with SGA / IUGR, further research is needed in relation to these two pregnancy predictors.*

**Recommendations.** *ECHO Doppler uterine methods have their own difficulties due to the high cost of, and the realization of ECHO Doppler benefits are great and practical. Opportunities for further study are opened, because a new database has been formed in this area of obstetrics from clinically validated and diagnosed patients.*

**Keywords:** uterine ECHO Doppler, SGA

## INTRODUCTION

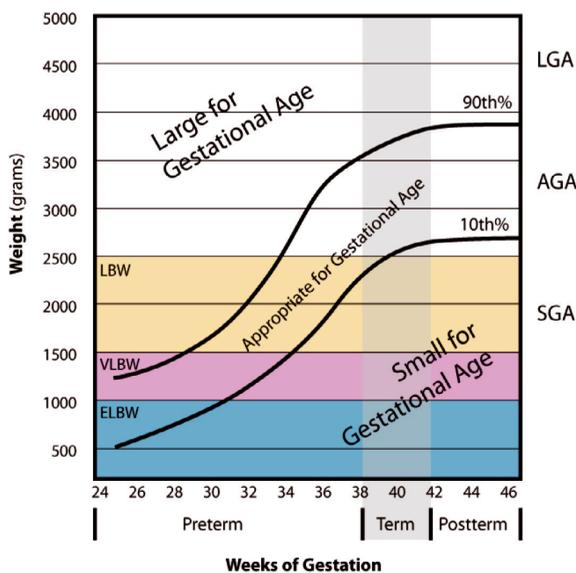
Diagnosis of pregnancy and fetal condition is achieved through several contemporary clinical, biochemical, physical and electronic methods for establishing a fetoplacental fetal diagnosis.

These processes result in typical physiological changes that can be observed in the mother, placenta, and fetus. Trophoblastic implantation and fertilization of the placenta plays a crucial role in

its development as an organ for the transport of food and oxygen to the fetus (1,2).

As placental dysfunction occurs in the first trimester of adherence, the last decade provides the opportunity to placental markers early detection of patients at risk for acupuncture clinical disease and their association with prediction of fruit growth (3). New protocols have been introduced. Diagnostic and predictive clinical application sic. It is a Doppler ultrasound method of the uterine ar-

teries, which is very predictive of the occurrence of eclampsia in the pregnancy which then has a direct impact on fetal growth. Roughly 1 in 10 babies are SGA / IUGR, the incidence of SGA / IUGR is higher in people of color than in white people. In developing countries in 1/3 of the cases the native causes are JH-gestation, while in 25% of fetal causes of increased in utero stagnation is hunger (4). LBW has an incidence of 8-10% in developed countries and 63% in developing countries. Pre-eclampsia complicates 4-8% of pregnancies (5). The average weight of the newborn is 2,500 to 4,000 gr with a length of 51 cm. The term low birth weight (LBW) refers to weight < 2,500 grams regardless of the age of the pregnancy. Most babies weighing < 2,500 g give birth prematurely (are born before week 37 of pregnancy). In contrast, the terms intrauterine growth restriction (IUGR) and small for fetal gestational age (SGA) are calculated with reference to the age of pregnancy (6). SGAs are fetuses who have birth weight less than 10% for their gestational age (7). IUGR is a term used for fetuses who fail to make their intrauterine growth optimal. These children are pathologically young, consequently those children have an increased risk for neurological problems, congenital malformations, hypoglycemia, hypocalcaemia, and respiratory distress syndromes (8,9). Synonymous for fruit malnutrition, chronic fetal distress, newborn with body mass in relation to SGA gestational age, increased intrauterine stagnation, (intrauterine growth retardation-IUGR (10) (figure 1).



**FIGURE 1.** Clasification of newborn with weeks and weight

Although some babies are constitutively small due to genetics (their parents are small), most SGA

babies are small due to the growth problems that occur during pregnancy (11). If the baby's birth weight is below the 10th percentile for pregnancy, the baby is also SGA. It is important to note that not all SGA newborns are IUGR, they are simply younger than normal because their parents are younger (12,13).

Low birth weight (LBW), a newborn with low birth weight, is defined as a newborn weighing less than 2,500 grams irrespective of gestational age (14).



**FIGURE 2.** Presentation of newborn SGA in relation to normal eutrophic newborn

Accurate screening protocols exist throughout the world in the first trimester, but objective factors sometimes influence non-adherence to these protocols, such as non-screening of pregnancies, non-management of pregnancies by primary care physicians, and so on (15). As mentioned above, preeclampsia and increased fetal stagnation are linked (16). EPH-Gestosis occurs in approximately 10-15% of first pregnancies and 5-10% of later pregnancies. Cases are diagnosed after the 34 th week of pregnancy (Robson, 1999).

ECHO Doppler of uterine arteries, In daily practice protocols there are a number of methods used in the form of screening for early diagnosis and prediction of concomitant concomitant and intrauterine growth of the fetus, undoubtedly the method used by the last uterine artery right and left, methods that are very important for detecting pregnancies that have early signs of developing JIT gestosis.

Increasingly, research is focused on early identification of pregnancy risks and intrauterine fetal development, thus creating early management strategies to minimize pregnancy risks. In the first trimester, and its role in predicting subsequent complications of pregnancy is discussed (17). ECHO uterine artery Doppler is used to predict adverse pregnancy outcomes such as "pre-eclampsia" and fetal "SGA" (small fetus for gestational age) (figure 3).



**FIGURE 3.** ECHO uterine artery Doppler

Uterine Doppler Ultrasound Examination (UtA) has become a valuable method for indirect assessment of uterine circulation, from the beginning of gestation, and has been considered as a potential screening tool for the development of preeclampsia, fetal growth restriction, defect of placenta, and death (18,19,20). Abnormal findings of UtA Doppler in patients with pregnancy-induced hypertension and / or small mephetus (SGA) from 12-16 weeks, are directly related to adverse outcomes. Maternal and / or perinatal (21). Pulsivity Index (PI) is currently the most used index for the UtA Doppler evaluation.

### OBJECTIVES

Impact Assessment of ECHO Doppler uterine parameters in the First trimester, with SGA / IUGR fetus.

### MATERIAL AND METHOD

The study is a prospective study conducted at the Special Mother-Gynecology Hospital “Mother Teresa”, Skopje-Skopje, and the Clinical-Biochemical Laboratory, Institute of Immunology at the University Clinical Center Skopje R, North Macedonia, February 2019 The study included 698 pregnant, aged 17-41 years, mean age 28.73 years ± 3.5 months, between 11 + 0 and 15 + 1 week of gestation. The EHO Doppler PI of the uterine arteries was counted as positive or lower than > 1.8 and negative with normal range <1.9. SGA / IUGR was calculated as < 2,500 g regardless of age of pregnancy.

### STATISTICAL CALCULATION OF VALUE

The collected data were recorded in Microsoft Access database, calculated using separate forms of Microsoft Exel 2007 and Windows 7. Computer data processing was performed with STATISTICA for Windows 8.0 and SPSS 8.0 for MS Windows.

Test Fischer was used for group comparison (22, 23), the MANN-Whitney test was used to compare variables (24).

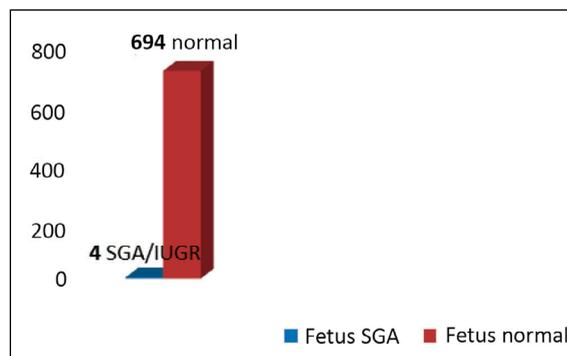
### OUTCOMES

Out of all controlled patients in the period February 2018-February 2019, a total of 698 pregnancies were studied, mean age 28.73 years ± 3.5 months, minimum age of study was 17 years, maximum 42 years. Of all 698 studies, 284 cases resulted in ECHO Doppler PI of the uterine arteries resulting in increased resistance in both uterine arteries, and in 414 cases PI resulted in normal resistance. Results obtained from data with ECHO Doppler of uterine arteries right and left in patients who resulted in SGA / IUGR resulted in 2 or (50%) two cases of increased resistance and in 2 or (50%) cases no increase in resistance.

### TABELAR AND GRAPHICAL REPRESENTATION OF DATA BY RESULTS

**TABLE 1.** Table representation of all 698 SGA / IUGR-born

Born SGA/IUGR	In Total 698	100 %
SGA/IUGR	4	0.57%
EUTROPHIC	694	99.43%



**FIGURE 4.** Graphical representation of all 698 SGA / IUGR-born

**TABLE 2.** Tabelar presentation of 4 cases have resulted SGA/IUGR

Fetus in total SGA/IUGR	4	100%
Normal values of PI- ECHO uterin Doppler	2	50%
Pathological values of PI-ECHO uterin Doppler	2	50%

Presentation of statistical calculated of sensitivity, sensitivity, PPV, NPV to ECHO Doppler uter-

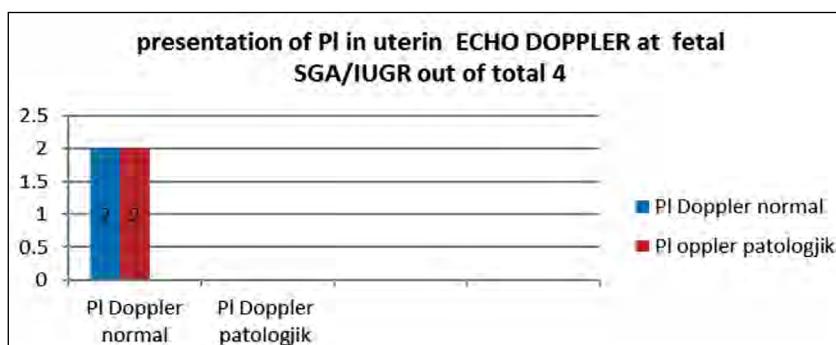


FIGURE 5. Graphical presentation of 4 cases have resulted SGA/IUGR

ine. Sensitivity 50%, specificity 50%, PPV 50%, NPV 50%,  $P = 0.5$   $R = 0.5$ .

## DISCUSSION

Assessment of placental development during pregnancy is one of the most important predictors of fetal development and pre-eclampsia. In modern acupuncture protocols, new diagnostic methods are of particular importance. Utilizing these methods is often impossible, since their cost is high, a maximum coordination of primary and secondary level obstetricians is also required to increase diagnostic efficiency. ECHO Doppler uterin: sensitivity 50%, specificity 50%, PPV 50%, NPV 50%,  $P = 0.52$ ,  $R = 0.5$ . Confirming high predictive values of ECHO Doppler uterin, but nonetheless that these parameters should be combined with other pregnancy diagnostic factors, and further research is needed on these two predictors of pregnancy. Fetus SGA / IUGR in 4 or 0.57%. Early diag-

nostic data may reduce inadequate sub-hospital controls, proper and adequate monitoring of these pregnancies, reduce the length of stay or exclude the need for hospitalization.

## CONCLUSIONS

ECHO Doppler of uterine arteries resulted in: 50% sensitivity, specificity 50%, PPV 50%, NPV 50%.  $P = 0.5$   $R = 0.5$ .

## RECOMMENDATIONS

ECHO Doppler uterine methods have their own difficulties due to the high cost of, and the realization of ECHO Doppler benefits are great and practical. Opportunities for further study are opened, because a new database has been formed in this area of obstetrics from clinically validated and diagnosed patients.

*Conflict of interest:* none declared

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