

# COMPARISON OF ULTRASONOGRAPHIC PLACENTA EXAMINATION WITH PATHOHISTOLOGICAL VERIFICATION OF FETAL ANOMALIES

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Ultrasonographic diagnostics is a sovereign diagnostic method of discovering disorders in growth and development of embryo.

The main aim of this research is the comparison of ultrasonographic placenta examination with pathohistologic treatment of placenta considering those pregnancies which were previously verified to have embryo anomalies and which were ended by the procedure of feticide. During the period of 2001 – 2004, 15 pregnant women, with gestation between 24th and 28th week, were hospitalized in our clinic. Ultrasonographic placenta examination was carried out during the expertized sonography immediately before deciding to commit feticide. The descriptive medical findings were divided into the clinical entities estimating the continuity of basal body, insertion, volume, and echo-structure of placenta substance.

The procedure of feticide was carried out in regular treatments using intracardial application of 7,4 % KCl or transabdominal, intra-amnial instillation of 20 % NaCl under the control of ultrasound.

The patients with the embryo anomalies were divided into three groups:

I – the group with the diagnosis of embryo hydrocephalus;

II – the group with the diagnosis of other anomalies of growth of embryo's CNS;

III – the group of patients with other embryo anomalies.

Pathohistologic placenta examinations were carried out in the Department of Pathology and Forensic Medicine in the Clinical Center Kragujevac.

The ultrasonographic placenta finding of the patients with the different embryo anomalies was not statistically very different ( $\chi^2$  – test;  $p=0,073$ ). However, beside the lack of the significant difference, what is reasonable considering the size of the sample, we noticed quite different ultrasonographic findings of the placenta examination of the patients having the embryo with hydrocephalus in comparison to those patients having the other embryo anomalies of CNS. The ultrasonographic placenta examination of the patients having the other embryo anomalies was similar to the finding of the patients having the embryo with hydrocephalus, and the most frequent finding in the group with hydrocephalus was cystic degeneration of placenta, and in the group with the other hydrops placenta anomalies. Among the groups of patients with different placenta anomalies, statistically significant difference was not noticed in the pathohistologic finding obtained by placenta examination ( $\chi^2$  – test;  $p=0,955$ ).

Ultrasonography is a sovereign, noninvasive diagnostic procedure in antenatal protection of pregnant women. If we should doubt that there exists inadequate growth and development of embryo, such pregnancy must be correctly diagnosed and treated as soon as possible, ideally until 22<sup>nd</sup> week of gestation. *Acta Medica Medianae 2007;46(2):71-75.*

**Keywords:** *placenta, fetal anomalies and ultrasonography*

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## Introduction

Ultrasonographic diagnostics is a sovereign diagnostic method of discovering disorders in growth and development of embryo (1). Routine ultrasound examination of healthy pregnant women means discovering the number of embryos, the position of embryo, embryo water, the place of placenta and the evaluation of normal placenta anatomy supplemented by standard fetal biometrics. If we should doubt that there exists inadequate growth and development of embryo and placenta, it is necessary to have a detailed, that is to say, expertise ultrasonographic examina-

tion, with the aim of recognition such inadequate growth and development (2,3). Having an ultrasound placenta examination, we can be informed about its localization, insertion, limitation and its thickness (volume) and tissue structure (4,5).

## The aim of the paper

The aim of this research is the comparison of sonographic placenta examination with pathohistological treatment of placenta considering those pregnancies which were previously verified to have embryo anomalies and which were ended by the procedure of feticide.

## Method

Using the retrospective analysis, we concluded that during the period of 2001 – 2004, 15 pregnant women were hospitalized in our clinic. Concerning that we dealt with those pregnancies with gestation between 24<sup>th</sup> and 28<sup>th</sup>

weeks, feticide was committed after receiving permission for ending pregnancy from the Ethics Committee. Ultrasonographic placenta examination was carried out during the expertized sonography immediately before deciding to commit feticide. The descriptive medical findings were divided into the clinical entities estimating the continuity of basal body, insertion, volume (thickness), and echo-structure of placenta substance. The procedure of feticide was carried out in regular treatments using intracardial application of 7,4 % KCl or transabdominal, intra-amnial instillation of 20 % NaCl under the control of ultrasound.

The patients with the fetal anomalies were divided into three groups:

- I- the group with the diagnosis of embryo hydrocephalus;
- II- the group with the diagnosis of other anomalies of growth of embryo's CNS;
- III- the group of patients with other embryo anomalies.

In the first group of the patients we had four cases of symmetric, and two cases of asymmetric dilatation of brain ventricle. The second group is presented by the following pathological pictures - Sy Dandy Walker - in one case, two cases of anencephalus. The third group consists of different pathological entities - Hydrothorax et ascites foetii in three cases of non-immunological origin, two cases of multiple anomalies of visceral organs with the defects of the front abdominal wall of embryo and anomalies of digestive tract of fetus with the image of anal atresia and resultant megacolon with the existence of skeletal anomalies of embryo. Pathohistologic placenta examinations were carried out in the Department of Pathology and Forensic Medicine in CC Kragujevac.

According to the description of ultrasonographic placenta examination, we reached the following results:

- I- group: cystic degeneration of placenta - 3, hydrops placenta - 2, homogenous structure of placenta - 1;
- II- group: hypertrophy of placenta - 1, nonhomogenous structure of placenta with calcification- 1, hypoplasia of placenta - 1;
- III- group: hypoplasia of placenta -1, hydrops of placenta-4, homogenous structure of placenta - 1.

According to the pathohistological placenta examination, the dominant presence of inflammatory-degenerative changes with the normal anatomy of blood vessel umbilical cord (14 patients) was proved, except in one case among the third group of patients with the presence of more blood vessels in umbilical cord with hypoplastic changes.

- I- group: Oedema funiculli umbilici - 6, Hyalinisatio et calcificatio placentae - 5, and Chorioamnionitis chronica - 1,
- II- group: Oedema funiculli umbilici - 2, Hyalinisatio et calcificatio placentae - 2, and Chorioamnionitis chronica - 1;

- III- group: Oedema funiculli umbilici - 6, Hyalinisatio et calcificatio placentae - 4, and Chorioamnionitis chronica - 2.

## Results

Table N° 1: Numerical and percentage review of the presence of fetal anomalies

Hydrocephalus foeti	The other anomalies of CNS	The other anomalies of embryo
6(40%)	3(20%)	6(40%)

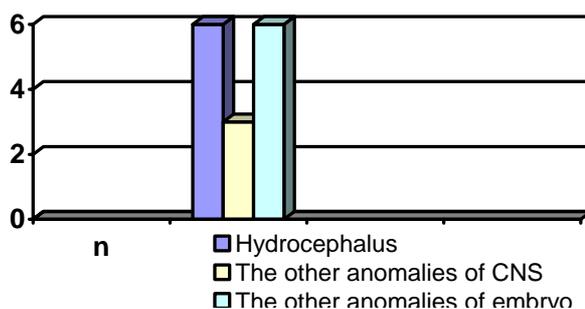


Diagram 1: Graphic representation of the fetal anomalies by groups

- I - the group with the diagnosis of embryo hydrocephalus - 6 patients;

- II - the group with the diagnosis of other anomalies of growth of embryo's CNS - 3 patients;

- III - the group of patients with other embryo anomalies - 6 patients;

Table 2: Descriptive finding of the ultrasonographic placenta examination by groups

Descriptive examination of the placenta by ultrasound	Hydrocephalus	The other anomalies of CNS	The other anomalies of embryo
Cystic structure	3	-	-
Hydrops	2	-	4
Homogenous structure *	1	-	1
Hypertrophic	-	1	-
Nonhomogenous	-	1	-
Hypoplastic	-	1	1

Table 3: Pathohistological findings of placenta examination by groups

PH finding	Hydrocephalus	Other anomalies of CNS	Other anomalies of embryo
Hyalinisatio et calcificatio placentae	5	2	4
Chorioamnionitis chronica	1	1	2
Oedema funiculli umbilici	6	2	6



*Anencephalus*



*Sz Dandy Walker*



*Hydrocephalus int*



*Omphalocele*



*Omphalocele*



*Hydrops placentae et Ascites foeti*



*Megacolon et atresia ani*



*Ascites foeti*



*Hydrocephalus*



*Degeneratio cystica placentae*



*Cysta placentae*



*Hypertrophio placentae*



*Hypertrophio placentae*



*Funiculus umbilicalis*



*Funiculus umbilicalis*



*Funiculus umbilicalis*



*Oedema funiculi umb.*



*Haemathoma retroplacentaris*

Table 4: Ultrasound and pathohistological finding of placenta of those patients with the embryo anomalies

THE OBSERVED PARAMETERS		GROUPS OF PATIENTS		
		Hydrocephalus of embryo	Other anomalies of the embryo's CNS	Other anomalies of embryo
Placenta finding obtained by ultrasound examination n(%)	Cystic degeneration of placenta	3 (50%)	0 (%)	0 (%)
	Hydrops of placenta	2 (33,3%)	0 (%)	4 (66,7%)
	Homogenous structure of placenta	1 (16,7%)	0 (%)	1 (16,7%)
	Hypertrophy of placenta	0 (%)	1 (33,3%)	0 (%)
	Nonhomogenous placenta with calcification	0 (%)	1 (33,3%)	0 (%)
	Hypoplasia of placenta	0(%)	1 (33,3%)	1 (16,7%)
Placenta finding obtained by pathohistological examination n(%)	Oedema funiculi umilici	6 (50%)	2 (40%)	6 (50%)
	Hyalinisatio et calcificatio placentae	5 (41,67%)	2 (40%)	4 (33,33%)
	Chorioamnionitis chronica	1 (8,33%)	1 (20%)	2 (16,67%)

Ultrasound placenta findings of those patients with the different embryo anomalies were not significantly different as far as statistics is concerned ( $\chi^2$ -test;  $p=0,073$ ). Even though there is no significant difference, what is logical according to the size of the sample, we can notice quite different ultrasound placenta findings of those patients with embryos having hydrocephalus in comparison to those patients with other anomalies of embryo's CNS. The ultrasound placenta finding of those patients with the other embryo anomalies was similar to the finding of the patients having embryos with hydrocephalus, and the most common finding of the group with hydrocephalus was cystic placenta degeneration, and in the group with the other embryo anomalies it was hydrops of placenta.

Between the groups of patients with the other embryo anomalies, we could not notice the statistically significant difference in the pathohistologic finding of placenta examination ( $\chi^2$ -test;  $p=0,955$ ).

### Discussion

Most embryo anomalies were discovered by ultrasound examination between the 24<sup>th</sup> and 26<sup>th</sup> week of gestation (12 patients), and anomalies were discovered in three cases in the 28<sup>th</sup> week of gestation. In all cases it was the first clinical examination. In case that there is a doubt

about disorders of growth and development of embryo, the recommendation is to have an expertized ultrasonographic examination between the 20<sup>th</sup> and 24<sup>th</sup> week of gestation, so that we could act as soon as possible in further treatments of such pregnancies (6,7). The analysis of the data given in the tables 2,3,4, in which the pathohistologic diagnosis is presented by sublimed pathological states, is not appropriate for statistical interpretation, which is not basically necessary concerning the comparison with the descriptive ultrasonographic finding after the placenta examination.

Ultrasonographic pathologic states found by the placenta examination were adequately confirmed by histologic examination. The comparison of biometrical parameters of anomalous embryos with pathohistologic findings was not possible, because in most cases the evacuation of embryo after feticide was done by using operative techniques (dissectio foetus).

### Conclusion

Ultrasonography is a sovereign, noninvasive diagnostic procedure in antenatal protection of pregnant women. In case that there is any doubt about disorders in growth and development of embryo, it is the imperative to adequately diagnose and treat such a pregnancy as soon as possible, ideally before the 22<sup>nd</sup> week of gestation.

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## KOMPARACIJA ULTRASONOGRAFSKOG PREGLEDA POSTELJICE SA PATOHISTOLOŠKOM VERIFIKACIJOM KOD FETALNIH ANOMALIJA

Dragan Lončar

Ultrasonografska dijagnostika predstavlja suverenu dijagnostičku metodu u otkrivanju poremećaja rasta i razvoja ploda.

Cilj ovog istraživanja bio je komparacija ultrasonografskog pregleda placente sa patohistološkom obradom posteljice kod trudnoća kod kojih su anomalije ploda ranije verifikovane i prekinute postupkom fetocida. U periodu od 2001. do 2004. u našoj Klinici hospitalizovano je 15 takvih trudnica, sa gestacijskom starošću između 24 i 28 nedelja. Ultrasonografski pregled posteljice vršen je u toku ekspertizne sonografije neposredno pre donošenja odluke o fetocidu. Opisne nalaze koji su tom prilikom saopštavani podelili smo u kliničke entitete procenjujući kontinuitet bazalne ploče, inserciju, volumen i ehostrukturu placentarne substance. Postupak fetocida vršen je uobičajenim postupcima intrakardijalnom aplikacijom 7,4% KCl ili transabdominalnom, intraamnijskom instilacijom 20% NaCl pod kontrolom ultrazvuka. Bolesnice kod kojih smo konstatovali anomalije ploda podelili smo u tri grupe i to:

I - grupa kod kojih je dijagnostikovano hidrocefalus ploda,

II - grupa bolesnica kod kojih su dijagnostikovane druge anomalije razvoja CNS-a ploda,

III - grupa bolesnica kod kojih su dijagnostikovane ostale anomalije ploda.

Patohistološki pregledi placenti vršeni su u Odeljenju za patologiju i sudsku medicinu KC Kragujevac.

Ultrasonografski nalaz na posteljici kod ispitanica sa različitim anomalijom ploda nije se statistički značajno razlikovao ( $\chi^2$ -test;  $p=0,073$ ). Međutim, i pored nepostojanja značajne razlike, što je razumljivo, s obzirom na veličinu uzorka, zapažamo sasvim različite ultrasonografske nalaze pregledom posteljice kod bolesnica kod kojih je plod imao hidrocefalus, posmatrano u odnosu na ispitanice čiji su plodovi imali ostale anomalije CNS-a. Ultrasonografski pregled posteljice kod bolesnica čiji su plodovi imali ostale anomalije bio je sličan nalazu ispitanica kod kojih je plod imao hidrocefalus, s tim što je najzastupljeniji nalaz u grupi sa hidrocefalusom bila cistična degeneracija placente, a u grupi sa ostalim anomalijama hidrops placente. Između grupa ispitanica sa različitim anomalijama ploda nije uočena statistički značajna razlika u patohistološkom nalazu dobijenom pregledom posteljice ( $\chi^2$ -test;  $p=0,955$ ).

Ultrasonografija predstavlja suverenu, neinvazivnu dijagnostičku proceduru u antenatalnoj zaštiti trudnica. U slučaju postojanja bilo kakve sumnje da se radi o neadekvatnom rastu i razvoju ploda imperativ je da se takva trudnoća što ranije, idealno do 22. nedelje gestacije, pravilno dijagnostikuje i leči. *Acta Medica Medianae* 2007;46(2):71-75.

**Ključne reči:** placenta, fetalne anomalije, ultrasonografija