

## FEATURES OF RETROCHOIR HEMATOMAS AND THEIR EFFECT ON THE COURSE OF PREGNANCY

*Ilona Koshova*

*Postgraduate student*

*Department of Obstetrics, Gynecology and Perinatology<sup>1</sup>*

*Oleksandra Lubkovska* ✉

*Department of Obstetrics, Gynecology and Perinatology<sup>1</sup>*

*Alexsunny24@ukr.net*

<sup>1</sup>*Ukrainian State Institute of Reproductology*

*Shupyk National Healthcare University of Ukraine*

*9 Dorohozhytska str., Kyiv, Ukraine, 04112*

✉ **Corresponding author**

### Abstract

**The aim.** Study of the features of retrochoir hematomas (RHG) and their influence on the formation of the placenta, the course of pregnancy, as well as the occurrence of premature birth.

**Materials and methods.** 2 groups of pregnant women were selected depending on the frequency of RHG formation: 1 group – 60 pregnant women with recurrent RHG, group 2 – 50 pregnant women with RHG, which was detected only in the early stages of pregnancy. extragenital and genital pathology did not differ reliably. All the women studied were anamnesis, examined, and ultrasound and dopplerometry were performed.

Statistical methods included an assessment of statistical significance using Student's t-criterion and criterion  $X^2$  and were considered significant at  $p < 0.05$ .

**Results.** Supracervical localization of hematomas prevailed in the studied pregnant women, namely: in group 1 – 51.7 % (in 31 pregnant women) and 68 % (in 34 women) in group 2. The same pattern was observed regarding the involution of hematomas.

Changes in the yolk sac were found in both groups with RHG (in 6.7 % of women (i.e., in 4 pregnant women) of group 1 and 4 % (in 2 pregnant women) of group 1.

Mean values of the pulsation index (PI) of blood flow velocity curves in the uterine arteries (UA) and umbilical cord artery (UCA) in pregnant women with RHG were higher than the standard average for gestational age.

In pregnant RHGs, a history of various types of fetal growth retardation (FGR) is detected. The number of early forms of URP was higher in group 1 (16.7 %, i.e. in 10 pregnant women) as opposed to group 2 (2.0 %, i.e. 1 case). The late form was approximately the same amount in both groups. Also, group 1 was characterized by a significantly larger number of FGR of 2–3 centuries.

In addition, in both groups with RHG, such pathological conditions were identified during pregnancy as the threat of premature birth, premature placental maturation, placental hypoplasia, oligohydramnios, and hydramnios.

**Conclusions.** Pregnant women with recurrent RHG compared to pregnant women with sporadic RHGs have a greater number of complications during pregnancy, including the threat of preterm labour, premature placental maturation, placental hypoplasia, oligohydramnios, hydramnios, FGR, impaired uterine-placental and placental-fetal blood flow.

**Keywords:** retrochoir hematoma, premature birth, fetoplacental complex, fetal growth retardation, dopplerometry.

DOI: 10.21303/2504-5679.2022.002590

### 1. Introduction

Retrochorial hematomas occupy an important place among obstetric and gynaecological complications, since they are one of the causes of placental dysfunction and, as a result, are the cause of various perinatal and neonatal pathologies.

According to many studies, most pregnant women with the threat of abortion are diagnosed with RHG. As is known, their formation in the early stages of pregnancy is accompanied by a violation of normal implantation processes, in particular, there is an inferior invasion of the trophoblast, accompanied by a violation of the formation of a full-fledged uterine-placental blood flow [1, 2].

There are many theories of the occurrence of RHG. These include hormone deficiency, infectious and inflammatory, various thrombophilia, immunological, etc. [3, 4].

As for the clinical manifestations of the formation of RHG, various variants of the course are possible, depending on the location, the volume of the hematoma, the causes that lead to its formation, the existing hemostasis disorders, etc. Supracervical located hematomas are always accompanied by external bleeding, which is not always an unfavourable option [5, 6]. Many studies prove that the evacuation of blood clots from the resulting cavity is a sign of positive dynamics.

The gold standard for the diagnosis of RHG is ultrasound. During the ultrasound, you can determine fresh hematomas or hematomas that have already begun to organize. The latter is characterized by the presence of echonegative structures, the number of which further increases until the hematoma looks like the tissue of a normal placenta [7, 8].

However, despite the significant number of publications on the formation of RHG, it remains a debatable issue in modern obstetrics and gynaecology.

The goal is to study the characteristics of RHG and their influence on the formation of the placenta, the course of pregnancy, as well as the occurrence of preterm labour.

## 2. Materials and methods

The study was conducted from 2020 to 2022 based on the Department of Obstetrics, Gynecology and Perinatology of the Shupyk National University of Health of Ukraine.

To achieve the goal, 110 pregnant women with RHG were selected and divided into two groups: group 1–60 pregnant women with recurrent RHG, and group 2–50 pregnant women with RHG, which was detected only in early pregnancy. Also, 30 pregnant women (control group) with uncomplicated pregnancies were selected to assess dopplerometric parameters. In all pregnant women, RHG was found in the first trimester of pregnancy.

The study was conducted following the Helsinki Declaration per the conclusion of the Ethics Commission of the Shupyk National University of Health of Ukraine (Protocol No. 2 of 11.02.2020). Informed consent to participate in the study was obtained from all women.

In group 1 with recurrent RHG, the average age of pregnant women was  $30.5 \pm 2.4$  (25 to 38 years); in group 2 –  $29.9 \pm 2.6$  (from 24 to 39 years old); in the control group –  $28.4 \pm 2.5$  (from 24 to 37 years), that is, based on age, the studied groups did not differ significantly ( $p > 0.05$ ).

All studied pregnant women were collected obstetric-gynaecological and somatic anamnesis, and gynaecological examination.

In all studied patients, no significant differences were found regarding obstetric, gynaecological and somatic history.

Ultrasound diagnostic and evaluation of blood flow in the «mother-placenta-fetus» system was carried out using the machine of the company «LOGIQ P9» (General Electric), transabdominal and transvaginal access (using vaginal (5–7 MHz) and sectoral sensors 3–5 MHz). During the ultrasound, the location of the fertile egg was determined, in particular, its size and the presence of any deviations from the norm were assessed. They also measured the diameter of the yolk sac, the thickness of the chorion, detected hematomas, evaluated their location, volume, and signs of involution, and also evaluated the blood flow in the uterine arteries and the arteries of the umbilical cord of the fetus.

Statistical processing of the obtained data was carried out using Statistica and Microsoft Office Excel programs. Evaluation of the statistical significance of the data obtained was carried out using Student's t-criterion and  $\chi^2$ . Differences were considered significant at  $p < 0.05$ .

## 3. Results

The obtained results of the study showed the peculiarities of echographic parameters of an embryo and fetal development during pregnancy during the formation and recurrence of RHG, in particular blood flow in the mother-placenta-fetus system in the presence of recurrent RHG.

All examined pregnant women of groups 1 and 2 were diagnosed with an ultrasound of RHG of different localization and volume. In group 1, all pregnant women were repeatedly diagnosed with RHG, that is, they were recurrent; in pregnant women of group 2 – RHG was detected only in terms 6–14 weeks, followed by involution and organization (**Table 1**).

In group 1 in the first trimester, RCG was first diagnosed in terms of up to 8 weeks in 51.7 % of pregnant women (i.e., in 31 pregnant women), in the period from 8 to 13+6 weeks –

in 48.3 % (i.e., in 29 pregnant women); in group 2 of RCG up to 8 weeks – in 68 % (that is in 34) women, from 8 to 13+6 weeks – in 32 % (in 16 pregnant women) ( $p > 0.05$ ).

**Table 1**

Features of ultrasound in the first trimester

Ultrasound sign	1 group <i>n</i> = 60		2 group <i>n</i> = 50		P
	%	Abs.	%	Abs.	
Hematoma for the first time to 8 weeks of gestation	51.7±6.5	31	68.0±6.5	34	$p > 0.05$
Term of the first detection of hematoma 8+1 – 13+6 weeks	48.3±6.5	29	32.0±6.5	16	$p > 0.05$
Supracervical hematoma	51.7±6.5	31	68.0±6.5	34	$p > 0.05$
Multiple (2–3) hematomas	6.7±3.2	4	6.0±3.4	3	$p > 0.05$
Large volume	10.0±3.9	6	10.0±4.2	5	$p > 0.05$
Signs of organization	46.7±6.4	28	80.0±5.7	40	$p < 0.05$
Involution up to 13+6 weeks:	80.0±5.1	48	100.0	50	
– up to 2 weeks	20.8±5.3	10	40.0±6.9	26	$p < 0.05$
– more than 2 weeks	79.2±5.2	38	60.0±6.9	24	
Changes in the yolk sac	6.7±3.2	4	4.0±2.8	2	$p > 0.05$
Lag of CTG embryo 7 or more days	6.7±3.2	4	6.0±3.4	3	$p > 0.05$

In addition, hematomas were initially more likely to have supracervical localization (in group 1 – 51.7 % (in 31 pregnant women) and 68 % (in 34 women) in group 2). This arrangement contributes to their faster drainage and emptying (which is clinically manifested by blood secretions from the genital tract). In addition, in the first trimester, the proportion of newly identified hematomas with signs of an organization is higher in group 2 of women with early-stage sporadic haemorrhages (80 % (40 pregnant women) versus 46.7 % (28 of women of group 1)) ( $p < 0.05$ ). Involution of hematomas up to 13+6 weeks occurred in 100 % of observations (that is, in 50) in women of group 2 and only in 80 % (in 48) in women of group 1 ( $p < 0.05$ ).

In addition to imaging the hematoma itself, its volume is important to predict the results and correctly assess the clinical situation. It should be noted that in pregnant women of both groups with hematomas, their large volume was detected with the same frequency ( $p > 0.05$ ).

Changes in the yolk sac (decrease/increase in diameter, increase in echogenicity of the walls, irregular shape) were observed in 6.7 % of observations (i.e., in 4 pregnant women) with recurrent hematomas and only in 4 % (in 2 pregnant women) in sporadic hematomas of the first trimester.

In recurrent hematomas and sporadic hematomas of early gestational hestation, lag of coccygeal-parietal size (CPZ) of the embryo/fetus for 7 days or more from the gestational age was observed approximately at an equal frequency (6.7 % and 6 %, respectively, i.e., in 4 and 3 pregnant women).

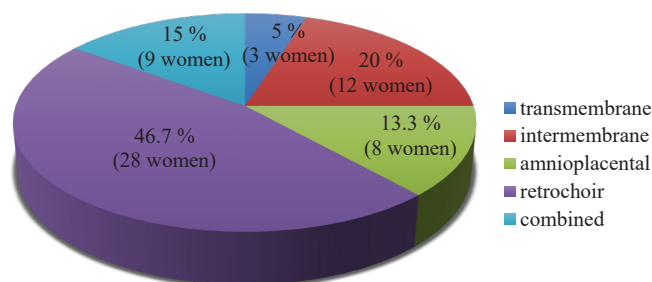
Analysis of the average values of PI of blood flow velocity curves in MA showed that in both groups with hematomas they were higher than the average standard values for the gestational age, both up to 10+6 weeks and in 11–13+6 weeks (**Table 2**).

**Table 2**

Average values of PI curves of blood flow rates in the uterine arteries in the first trimester of gestation

Gestational age	PI norm (average value)	PI 1 group	R	PI 2 group	R
Up to 10+6 weeks	1.91±0.05	2.34±0.12	$p < 0.05$	2.21±0.07	$p < 0.05$
11–13+6 weeks	1.75±0.07	2.45±0.10	$p < 0.05$	2.31±0.09	$p < 0.05$

The study found that most often repeated hematomas occurred in the retrochoir zone (46.7 %, that is, in 28 pregnant women), as well as intermembranous (20 %, that is, in 12 women) (**Fig. 1**).



**Fig. 1.** The frequency of different types (localization options) of hematomas in the examined pregnant women with a recurrent variant (%)

The study also analyzed the features of fetometry, placentaography, dopplerometry in the examined pregnant women (with recurrent RHG and sporadic hematoma of early gestation) during the II and III trimesters of pregnancy. Of greatest interest were echographic data relating to signs of placental dysfunction (PD) (Table 3).

**Table 3**

Echographic signs of placental dysfunction in pregnant women with RHG (%)

Ultrasound sign	1 group <i>n</i> = 60		2 group <i>n</i> = 50		<i>P</i>
	%	Abs.	%	Abs.	
FGR early form (up to 32 weeks)	16.7±4.8	10	2.0±2.0	1	<i>p</i> < 0.05
Late form of FGR (after 32 weeks)	8.3±3.5	5	4.0±2.8	2	<i>p</i> > 0.05
FGR asymmetric version	8.3±3.5	5	4.0±2.8	2	<i>p</i> > 0.05
FGR symmetrical version	16.7±4.8	10	2.0±2.0	1	<i>p</i> < 0.05
Grades 2–3	10.0±3.9	6	–	–	<i>p</i> < 0.05
Premature maturation of the placenta	33.3±6.1	20	16.0±5.2	8	<i>p</i> < 0.05
Placental hypoplasia	13.3±4.4	8	2.0±2.0	1	<i>p</i> < 0.05
Low water	18.3±4.9	11	4.0±2.8	2	<i>p</i> < 0.05
Hydramnios	6.7±3.2	4	4.0±2.8	2	<i>p</i> > 0.05
Hemodynamic disorders in the mother-placenta-fetus system	23.3±5.5	14	8.0±3.8	4	<i>p</i> < 0.05
Decompensated PD	10.0±3.9	6	–	–	<i>p</i> < 0.05

The data obtained during the study showed that in pregnant women with recurrent RHG and RHG only early stages of pregnancy, different phenotypes of FGR are detected. Thus, women of group 1 are characterized by a high frequency of early form of FGR and are significantly higher compared to group 2, namely 16.7 % versus 2.0 % (10 and 1 cases, respectively), *p* < 0.05. A late form of FGR was also present in both groups, but its frequency did not significantly differ *p* > 0.05. Also, in group 1, a significantly higher number of FGR of the symmetric variant was found (16.7 % vs. 2.0 %, i.e., 10 and 1 cases) and grade 2–3 GRP (10 % (i.e., 6) in pregnant women with recurrent RHG and no cases in pregnant women with sporadic RHGs). In addition, it was found that pregnant women with pathologies such as RHG during pregnancy experience such pathological conditions as premature maturation of the placenta, placental hypoplasia, low water, hydramnios and hemodynamic disorders in the mother-placenta-fetus system. It should be noted that the number of cases of premature maturation of the placenta, low water, placental hypoplasia, decompensated PD and hemodynamic disorders was significantly higher in group 1 *p* < 0.05.

After analyzing the blood flow in the uterine arteries and the artery of the umbilical cord in the studied pregnant women, it was found that the average values of PI in these vessels were significantly worse compared to uncomplicated pregnancy (Table 4).

**Table 4**

Mean values of PI in the uterine arteries, and umbilical cord artery in pregnant women with RHG after 24 weeks of gestation

Group of examined pregnant women	UA	UCA
	<b>PI</b>	
Norm	0.86±0.05	0.92±0.03
2 group	1.38±0.06	1.28±0.03
	$p < 0.05$	$p < 0.05$
1 group	1.76±0.10	1.65±0.10
	$p < 0.05$	$p < 0.05$

Taking into account the data obtained, the number of cases of preterm birth was analyzed. Thus, in 41.7 % (25) of patients with recurrent hematoma, the threat of premature birth was detected, and in pregnant women with hematoma only in the early stages – in 28 % (14). At the same time, early and early PP (up to week 28) occurred in 10 % (6) of women with recurrent hematoma and 6 % (3) – with early-term hematoma, which will certainly affect the perinatal results in general. PP by week 36 occurred in 16.7 % (10) of women of group 1 and 6.0 % (3) – 2 groups.

#### 4. Discussion of research results

A common sign of the pathological development of chorion is the formation of RHG, provoking the death of the embryo and the development of placental dysfunction. It acts as an aggravating factor of disorders in the period of an early and late stage of implantation, since changes in the hemostasis system develop [9, 10]. Most often RHG occurs in the first trimester of pregnancy.

It is also known that the localization of RHG plays an important role in the course of pregnancy and in predicting the outcome of such pregnancy [11, 12]. Thus, in the study, it was found that in more than half of pregnant women of groups 1 and 2, RCG had supracervical localization, namely 59.1 % (65 women).

In addition, the speed of organization of RHG plays a small role in the process of normal pregnancy and full fetal development of the fetus, namely, the sooner hematomas begin to organize, the more favourable it is for pregnancy. Analysis of the literature showed that in pregnant women with sporadic hematomas, this process occurs faster [13]. A study that was conducted also showed that in the first trimester of pregnancy in the group with a single detection of RHG, the signs of the organization were significantly higher than in the group with recurrent RHG, namely 51.7 % (in 31 pregnant women) and 68 % (in 34 women). that is, in 50 women, as opposed to 1 group, where this figure was 80 % (in 48 pregnant women), which was significantly higher.

With the recurrence of RHG, pathological changes in the yolk sac are observed, which reflects quite serious changes in the fetoplacental complex. During the study, changes in the yolk sac were also found. In group 2, a smaller amount of such pathology was found than in group 1 (4 % (2 pregnant) versus 6.7 % (4 pregnant women)), which once again confirms the opinions of many authors [14, 15].

According to many studies [16, 17], in RHG, there may be a lag in the embryo/fetus CPZ from the proper gestational age. In addition, it is more common with recurrent hematomas. The results of the study found that this pathology was observed both in groups 1 and 2, although between both groups it was statistically insignificant (6.7 % and 6 %, respectively, that is, in 4 and 3 pregnant women).

It is known that the formation of hematomas, in particular in the early stages of gestation, adversely affects the formation of the placenta. This is manifested, in particular, by pathological changes in the bloodstream. As a rule, in the early stages of pregnancy, only changes in the uterine blood flow are observed. This is due to violations of the trophoblast invasion process [18, 19]. The results of the study showed that in all pregnant women of RHG there were such changes

in UA, namely, the average values of the PI of blood flow velocity curves in UA were higher than the average standard indicators for the gestational age. In the second and third trimesters of pregnancy, more pronounced pathological changes in the mother-placenta-fetus system will be observed. Thus, the analysis of the results revealed violations in the bloodstream not only in UA but also in the UCA. Average PI values in these vessels were significantly worse compared to uncomplicated pregnancy.

The development of placental dysfunction in the background of RHG leads to complications such as premature maturation of the placenta, placental hypoplasia, low water, multi-water, and FGR [20]. It should be noted that such disorders, in most cases, are reliably more common in pregnant women with recurrent RHD. The obtained data showed that the last pregnant women were characterized by a significantly higher incidence of both the early form (16.7 % in group 1 versus 2.0 % in group 2 (10 and 1 cases, respectively) and the symmetrical variant (16.7 % in group 1 versus 2.0 % in group 2, i.e. 10 and 1 cases) of the FGR, namely 10 % (i.e. 6) in group 1 and no cases in pregnant women in group 2.

The presence of RHG leads to pronounced changes in the mother-placenta-fetus system, manifested by threatening abortion in early pregnancy and the threat of premature birth at a later date of gestation. This is due to a decrease in the normally functioning area of the placenta, a violation of the homeostasis system, and the development of an inflammatory response to RHG. All this is a risk of premature birth, which negatively affects the perinatal consequences and the health of the nation as a whole [21]. The study also found in 41.7 % (25) of patients in group 1 and 28 % (14) 2 groups the threat of premature birth, which once again confirmed the development of pathological processes in the mother-placenta-fetus system in pregnant women with RHG.

So, after analyzing the data obtained, it was found that the formation of RHG adversely affects the formation of the placenta with the development of further placental dysfunction, as well as the course of pregnancy with the occurrence of premature birth.

**Limitations of the study.** The study did not involve women with multiple pregnancies, drug and alcohol addiction, severe somatic pathology, and diabetes.

**Prospects for further research.** Reducing the frequency of complications in childbirth and the postpartum period, as well as reducing the frequency of perinatal pathology.

## 5. Conclusions

1. The occurrence of sporadic RHG is observed more often up to 8 weeks of pregnancy, in contrast to recurrent RHGs, the occurrence of which often occurs within a period of 8+1 day – 13+6 days.

2. More than half of pregnant women with RHG have hematomas with supracervical localization.

3. Recurrent hematomas most often have localization in the retrochoir zone.

4. Sporadic RHGs are characterized by significantly earlier signs of hematoma organization than recurrent RHG.

5. Involution of sporadic hematomas occurred in 100 % in the first trimester of gestation, as opposed to recurrent ones, where this figure was 80 %.

6. Changes in the yolk sac and lag of the embryo/fetus CPZ from the proper gestational age are more common in pregnant women with recurrent RHGs.

7. In the first trimester, pregnant women with RHG are characterized by impaired blood flow in the uterine arteries, namely an increase in the average values of PI of blood flow curves in UA. In the second and third trimesters of pregnancy in these women, the average values of the PI of the velocity curves in UA and UCA are significantly higher compared to uncomplicated pregnancy, indicating impaired blood flow in these vessels.

8. Pregnant women with RHG during pregnancy have complications such as premature maturation of the placenta, placental hypoplasia, low water, multi-water, and FGR. Moreover, a greater number of them is observed in pregnant women with recurrent RHG.

9. The number of cases of the threat of preterm birth and preterm birth was greater in pregnant women with recurrent RHG.

**Conflict of interest**

The authors declare that there is no conflict of interest concerning this paper, as well as the published research results, including the financial aspects of conducting the research, obtaining and using its results, as well as any non-financial personal relationships.

**Financing**

The study was performed without financial support.

**References**

- [1] Soldo, V., Cutura, N., Zamurovic, M. (2013). Threatened miscarriage in the first trimester and retrochorial hematomas: sonographic evaluation and significance. *Clinical and Experimental Obstetrics & Gynecology*, 40 (4), 548–550.
- [2] Shi, X., Du, L., Su, Q., Tian, Y. (2019). Comparative study of clinical features and pregnancy outcomes of intrauterine subchorionic hematoma and retroplacental hematoma. *Chinese Journal of Postgraduates of Medicine*, 36, 900–903.
- [3] Li, Y., Wang, E., Huang, S., Zhu, C., Zhang, K., Zhang, J. et. al. (2021). Autoantibodies in association with subchorionic haematoma in early pregnancy. *Annals of Medicine*, 53 (1), 841–847. doi: <http://doi.org/10.1080/07853890.2021.1936150>
- [4] Sultangadzhieva, K. G., Khizroeva, J. K. (2020). Pathogenetically differentiated management of pregnancy in patients with retrochorial hematoma. *Obstetrics, Gynecology and Reproduction*, 14 (1), 15–24. doi: <http://doi.org/10.17749/2313-7347.2020.14.1.15-24>
- [5] Milovanov, A. P., Kuznetsova, N. B., Bushtyeva, I. O. (2016). The morphology, typical combinations of polymorphic genes of hemostasis, and specific features of the pathogenesis of retrochorial hematoma in missed abortion. *Arkhiv Patologii*, 78 (5), 3–8. doi: <http://doi.org/10.17116/patol20167853-8>
- [6] Orujova, P. F., Shamhalova, I. A. (2018). Sonographic parameters in women with retrochorial hematoma in the I Trimester of pregnancy. *Azerbaidzhanskyi medytsynskyi zhurnal*, 1, 55–60.
- [7] Lisova, K. M., Kalinovska, I., Tokar, P. (2022). Ultrasound characteristic of embryo, fetal egg and chorionic structures in pregnant women with miscarriage. *Wiadomości Lekarskie*, 75 (1), 75–78. doi: <http://doi.org/10.36740/wlek202201114>
- [8] Heller, H. T., Asch, E. A., Durfee, S. M., Goldenson, R. P., Peters, H. E., Ginsburg, E. S. et. al. (2018). Subchorionic Hematoma: Correlation of Grading Techniques With First-Trimester Pregnancy Outcome. *Journal of Ultrasound in Medicine*, 37 (7), 1725–1732. doi: <http://doi.org/10.1002/jum.14524>
- [9] Sukur, Y. E., Goc, G., Kose, O., Acmaz, G., Ozmen, B., Atabekoglu, C. S. et. al. (2014). The effects of subchorionic hematoma on pregnancy outcome in patients with threatened abortion. *Journal of the Turkish German Gynecological Association*, 15 (4), 239–242. doi: <http://doi.org/10.5152/jtgga.2014.14170>
- [10] Ott, J., Pecnik, P., Promberger, R., Pils, S., Binder, J., Chalubinski, K. M. (2017). Intra- versus retroplacental hematomas: a retrospective case-control study on pregnancy outcomes. *BMC Pregnancy and Childbirth*, 17 (1). doi: <http://doi.org/10.1186/s12884-017-1539-6>
- [11] Xiang, L., Wei, Z., Cao, Y. (2014). Symptoms of an Intrauterine Hematoma Associated with Pregnancy Complications: A Systematic Review. *PLoS ONE*, 9 (11), e111676. doi: <http://doi.org/10.1371/journal.pone.0111676>
- [12] Naert, M. N., Muniz Rodriguez, A., Khadraoui, H., Naqvi, M., Fox, N. S. (2019). Association Between First-Trimester Subchorionic Hematomas and Adverse Pregnancy Outcomes After 20 Weeks of Gestation in Singleton Pregnancies. *Obstetrics & Gynecology*, 134 (4), 863–868. doi: <http://doi.org/10.1097/aog.0000000000003487>
- [13] Karaçor, T., Bülbül, M., Nacar, M. C., Kırıcı, P., Peker, N., Ağaçayak, E. (2019). The effect of vaginal bleeding and non-specific pelvic pain on pregnancy outcomes in subchorionic hematomas cases. *Ginekologia Polska*, 90 (11), 656–661. doi: <http://doi.org/10.5603/gp.2019.0111>
- [14] Janowicz-Grelewska, A., Sieroszewski, P. (2013). Prognostic significance of subchorionic hematoma for the course of pregnancy. *Polish Gynaecology*, 84 (11). doi: <http://doi.org/10.17772/gp/1664>
- [15] Liu, Y., Tong, A., Qi, X. (2020). A large subchorionic hematoma in pregnancy. *Medicine*, 99 (22), e20280. doi: <http://doi.org/10.1097/md.00000000000020280>
- [16] Hashem, A., Sarsam, S. D. (2018). The Impact of Incidental Ultrasound Finding of Subchorionic and Retroplacental Hematoma in Early Pregnancy. *The Journal of Obstetrics and Gynecology of India*, 69 (1), 43–49. doi: <http://doi.org/10.1007/s13224-017-1072-6>
- [17] Naert, M. N., Khadraoui, H., Muniz Rodriguez, A., Naqvi, M., Fox, N. S. (2019). Association Between First-Trimester Subchorionic Hematomas and Pregnancy Loss in Singleton Pregnancies. *Obstetrics & Gynecology*, 134 (2), 276–281. doi: <http://doi.org/10.1097/aog.0000000000003360>

- [18] Kamble, P. D., Bava, A., Shukla, M., Nandanvar, Y. S. (2017). First trimester bleeding and pregnancy outcome. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*, 6 (4), 1484–1488. doi: <http://doi.org/10.18203/2320-1770.ijrcog20171414>
- [19] Kyser, K. L. (2012). Meta-analysis of subchorionic hemorrhage and adverse pregnancy outcomes. *Proceedings in Obstetrics and Gynecology*, 2 (4). doi: <http://doi.org/10.17077/2154-4751.1137>
- [20] Tuuli, M. G., Norman, S. M., Odibo, A. O., Macones, G. A., Cahill, A. G. (2011). Perinatal Outcomes in Women With Subchorionic Hematoma. *Obstetrics & Gynecology*, 117 (5), 1205–1212. doi: <http://doi.org/10.1097/aog.0b013e31821568de>
- [21] Ji, W., Li, W., Mei, S., He, P. (2016). Intrauterine hematomas in the second and third trimesters associated with adverse pregnancy outcomes: a retrospective study. *The Journal of Maternal-Fetal & Neonatal Medicine*, 30 (18), 2151–2155. doi: <http://doi.org/10.1080/14767058.2016.1241762>

*Received date 07.06.2022*

*Accepted date 19.07.2022*

*Published date 31.07.2022*

© The Author(s) 2022

*This is an open access article  
under the Creative Commons CC BY license*

**How to cite:** Koshova, I., Lubkovska, O. (2022). Features of retrochoir hematomas and their effect on the course of pregnancy. *EUREKA: Health Sciences*, 4, 18–25. doi: <http://doi.org/10.21303/2504-5679.2022.002590>