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# Pathological Pregnancy and Psychological Symptoms in Women

Vedran Bjelanović<sup>1</sup>, Dragan Babić<sup>2</sup>, Slavko Orešković<sup>1,3</sup>, Vajdana Tomić<sup>1</sup>, Marko Martinac<sup>2</sup> and Josip Juras<sup>3</sup>

<sup>1</sup> Mostar University Hospital Centre, Department of Gynecology and Obstetrics, Mostar, Bosnia and Herzegovina

<sup>2</sup> Mostar University Hospital Centre, Department of Psychiatry, Mostar, Bosnia and Herzegovina

<sup>3</sup> University of Zagreb, Zagreb University Hospital Centre, Department of Gynecology and Obstetrics, Zagreb, Croatia

## ABSTRACT

*Pregnancy is followed by many physiologic, organic and psychological changes and disorders, which can become more serious in pregnancy followed by complications, especially in women with pathological conditions during pregnancy. The purpose of this study was to find out and analyze the prevalence and intensity of psychological disorders in women with pathological conditions during pregnancy and compare it with conditions in pregnant women who had normal development of pregnancy. The research is approved by the Ethical committee of the Mostar University Hospital Center, and it was made in accordance with Helsinki declaration and good clinical practices. The research conducted section for pathology of pregnancy of Department for gynecology and obstetrics of the Mostar University Hospital Center. It included 82 pregnant women with disorders in pregnancy development and control group consisted of pregnant women who had normal development of pregnancy. The research work was conducted from September 2007 to August 2008 in Mostar University Hospital Center. Pregnant women had Standard and laboratory tests, Ultrasound. CTG examinations were done for all pregnant women and additional tests for those women with complications during pregnancy. Pregnant women completed sociobiographical, obstetrical-clinical and psychological SCL 90-R questionnaire. Pregnant women with pathological pregnancy exhibited significantly more psychological symptoms in comparison to pregnant women with normal pregnancy ( $p < 0.001$  to  $p = 0.004$ ). Frequency and intensity of psychical symptoms and disorders statistically are more characteristic in pathological pregnancy (61%/40.6%). The statistical data indicate a significantly higher score of psychological disorders in those pregnant women with primary school education ( $p = 0.050$ ), those who take more than 60% carbohydrates ( $p = 0.001$ ), those with pathological CTG records ( $p < 0.001$ ), those with pathological ultrasound results ( $p < 0.001$  to 0.216) and those pregnant women with medium obesity and obesity ( $p = 0.046$ ). Body mass index (BMI) during normal pregnancy development is lower ( $p = 0.002$ ) but the levels of glucose, triglycerides, cholesterol, HDL and LDL in blood are higher. Blood pressure in pregnant women with pathological pregnancy was statistically significantly higher ( $p < 0.001$ ). Diagnostic criteria for the metabolic syndrome were found in 19 pregnant women with the pathological pregnancy. Statistically, in those women, a significantly higher appearance of psychological symptoms and disorders was observed in comparison to the pregnant women without metabolic syndrome ( $p < 0.001$ ). The research has shown that 87.8% from all pregnant women included in this study have been hospitalized due to premature birth, hypertensive disorders, and diabetes in pregnancy, and also due to bleeding in the second and third trimester of pregnancy.*

**Key words:** pathology and normal pregnancy, psychological symptoms, metabolic syndrome

## Introduction

Pregnancy is physiological condition but great experience for every woman. Along with physiologic and organ pregnancy brings different psychological changes. They are dependent on the basal structure of personality, socio-economic status, and physiological pregnancy de-

velopment along with correlated changes. The majority of pregnant women experience pregnancy as a wanted and expected happening and does not manifest significant psychological changes. Those pregnant women who have feeling that »something is wrong with their preg-

nancy« more often show anxiety, depression, somatization, conversivity, psychosis, paranoid and disorganized behavior. The time spent under the stress is longer and the odds for development of different psychological disorders are greater. The psychological disorders of pregnant women are rarely analyzed, and those of women with pathological pregnancies even less. About 10% of all pregnancies are complicated by some pathological condition<sup>1,2</sup>. These conditions develop more frequent during 2<sup>nd</sup> and 3<sup>rd</sup> trimester. Within this study the most frequent disorders were imminent preterm delivery<sup>3,4</sup>, gestational hypertensive disorders<sup>5,6</sup>, diabetic pregnancies<sup>7</sup>, intra-uterine fetal growth retardation and the pathological conditions of amniotic fluid<sup>8,9</sup>.

### Objective

The aim of study was to explore and determine the intensity, frequency and expressivity of psychological symptoms and disorders in women with pathological pregnancy in comparison with pregnant women without any pathological condition of pregnancy. We wanted to explore the sociodemographic characteristics of psychological symptoms and disorders of women with and without pathological course of pregnancy<sup>10,11</sup>. The specific aim was to explore the correlation between obstetric and psychological pathological symptoms and disorders, and to show the correlation of metabolic syndrome (or its components) and certain psychological pathological symptoms and disorders<sup>12,13</sup>.

### Materials and methods

This cross-sectional study included 82 pregnant women in their second and third trimester who have been hospitalized at the Department of Obstetrics and Gynecology of Mostar University Hospital Center and 80 pregnant women with the normal development of pregnancy (control group). Including criteria were: older than 18 but than 40 regardless of parity. All pregnant women were physically and psychologically healthy. Excluding criteria were: first trimester of pregnancy, pregnant women with psychological disorder confirmed before pregnancy, mentally retarded women, pregnant women who have been diagnosed with fetal anomaly during early stage of pregnancy and women in puerperium. The forms were filled during pregnancy and maximum 48 hours after giving birth. The forms used in this research were sociobiographical, obstetrical-gynecological and standardized psychological questionnaire (SCL 90-R)<sup>14</sup>. Sociodemographical questionnaire gives data about years of life, formal education, marital, working and financial status, the place of residence, alcohol and tobacco consumption, personal and family disease history, and other general data. Obstetrical-gynecological questionnaire shows the data about previous pregnancies and abortions, surgical procedures, the course of pregnancy, obstetrical findings, the data regarding fetal monitoring, ultrasound and laboratory findings, the diagnosis and given therapy. The tool for psychological evaluation was standardized ques-

tionnaire »Scala di autovalutazione SCL 90-R«. It contains 90 questions answered by pregnant women. Each question has 5 particles describing the intensity of difficulties (from 0-none to 4-very strong). The questionnaire is valid when at least 80% of questions are answered.

Clinical examination: all pregnant women have their full blood count, serum glucose level, triglycerides, cholesterol, high and low density lipoproteins (HDL and LDL), urinary analysis. Women with pathological course of pregnancy had additional laboratory tests (urea, creatinine, uric acid, proteinuria, blood coagulation tests and blood electrolytes). Every pregnant woman had fetal heart rate monitored once a day. Those with pathological course of pregnancy had it monitored twice a day. Every pregnant woman had gynecological and ultrasound examination and in case of pathological findings color Doppler (blood flow through umbilical artery and fetal medial cerebral artery) along with additional examinations (ultrasound examination of abdomen and kidneys, the X-rays of head and lungs). The examinations of other specialists were made if needed. The prepregnancy body mass index (BMI) was calculated. The normal weight gain during pregnancy was considered to be to 12.5 kilos (fetus, placenta, and amniotic fluid, the retention of fluids and increase of weight up to 4 kilos). All pregnant women were divided into three groups according to BMI: normal weigh women, overweight and obese.

### Statistics

For statistical analysis we used SPSS 11.0 for Windows (IBM, NY, USA). For the normality of distribution we used Kolmogorov – Smirnov test. To explore the difference in proportions we used Chi square test and for evaluation of differences among continuous variables we used Student's t-test of independent samples. The statistical significance was accepted when  $p < 0.05$ .

### Results

With regard to multidimensional study and large number of variables the results were arranged into four categories: psychological, socio-demographical and obstetrical characteristics in normal and pathological pregnancy and characteristics of women with metabolic syndrome.

Analyzing all the pregnant women there was a significant difference in all psychological disorders having greater frequency of disorders among women with the pathological course of pregnancy (Table 1).

The indicator of symptoms correlated to stress was found in 40.6% of pregnant women compared to 61% of those ones with pathological course of pregnancy.

There was a statistically significant greater frequency and intensity of symptoms in women with pathological pregnancies (especially somatization, anxiety, obsessive-compulsive symptoms, and depression, general and non-specific symptoms) (Table 2). Every pregnant woman had her fetal heart rate monitored (FHR). There were 16

**TABLE 1**  
THE INTENSITY OF PSYCHOLOGICAL SYMPTOMS BETWEEN WOMEN WITH NORMAL AND PATHOLOGICAL COURSE OF PREGNANCY

SCL 90-R	Pregnancy		N		t	p
	Normal	82	Pathological	82		
Somatization	0.62±0.42	12	1.19±0.79	21	5.74	<0.001
Obsessive-compulsive symptoms	0.49±0.44	11	1.07±0.66	20	6.53	<0.001
Interpersonal vulnerability	0.49±0.46	11	0.76±0.44	16	3.75	<0.001
Depression	0.67±0.45	12	1.07±0.52	17	5.23	<0.001
Anxiety	0.76±0.52	13	1.40±0.67	25	6.84	<0.001
Aggressiveness	0.38±0.46	10	0.62±0.39	14	3.52	0.001
Phobias	0.22±0.32	9	0.46±0.42	14	4.04	<0.001
Paranoia	0.42±0.47	10	0.67±0.42	15	3.51	0.001
Psychotic characteristics	0.33±0.33	9	0.47±0.31	12	2.89	0.004
Non-specific symptoms	0.70±0.44	12	1.23±0.59	21	6.38	<0.001

**TABLE 2**  
THE FREQUENCY AND INTENSITY OF PSYCHOLOGICAL SYMPTOMS BETWEEN WOMEN WITH NORMAL AND PATHOLOGICAL COURSE OF PREGNANCY DUE TO ANSWERS IN QUESTIONNAIRE

Answer	The normal course of pregnancy		The pathological course of pregnancy		Statistics	
	N	%	N	%	$\chi^2$	p
0	4276	59.40	2877	39.00	605,896	<0.001
1	2057	28.57	2847	38.59	163,414	<0.001
2	653	9.07	859	11.64	25,614	<0.001
3	179	2.49	638	8.65	261,093	<0.001
4	34	0.47	156	2.11	75,100	<0.001

(19.5%) pregnant women with the pathological findings of FHR and non in the group of women having the normal course of pregnancy. Hospitalized women with pathological FHR more frequently had all the psychological symptoms included in the study, such as aforementioned ones (somatization  $t=6.37$ ,  $p<0.001$ ; anxiety=6.86;  $p<0.001$ , obsessive-compulsive symptoms  $t=7.29$ ;  $p<0.001$ ; and depression  $t=6.37$ ,  $p<0.001$ , general and nonspecific symptoms  $t=5.49$ ,  $p<0.001$ ). The ultrasound examinations showed similar situation. Of all the pregnant women with pathological course of pregnancy 62 (83%) had normal ultrasound findings and 14 (17%) had some pathological finding. Those women with pathological ultrasound examination had greater frequency of psychological symptoms and disorders (somatization  $t=5.61$ ,  $p<0.001$ ; anxiety=5.03;  $p<0.001$ ; and depression  $t=4.97$ ,  $p<0.001$ , general and nonspecific symptoms  $t=5.39$ ,  $p<0.001$ ) (Table 3).

There was statistically different mean value of blood pressure between women with the normal and pathological course of pregnancy ( $p<0.001$ ). Women with some pathological findings had mean value of 132.68 mmHg (systolic) and 84.94 mmHg (diastolic), and those with normal pregnancy had lower mean values (118.13 mmHg for systolic and 75.13 mmHg for diastolic blood pressure). This was particularly the case of women having

hypertensive disorders during pregnancy. The pathological course of pregnancy often carries greater risk of developing intrauterine growth retardation (IUGR), reduced oxygenation of fetus etc, and newborns weight was also showed significant difference. There were 16 pathological FHRs among pathological pregnancies and none among normal pregnancies. Pathological FHR was mostly found when IUGR was present (6 records), hypertensive disorders (4 records), and oligohydramnion (4 records) ( $p<0.001$ ). Ultrasound examination showed some pathology in 14 pregnant women with pathological course of pregnancy ( $p=0.040$ ) There was no difference in laboratory metabolic syndrome components between women grouped by body weight except the concentration of glucose (Table 4).

## Discussion and Conclusion

Due to becoming aware of the pathological course of pregnancy, hospital environment and its influence, and medical staff and procedures, there are psychological symptoms and disorders developed more often. The symptoms and disorders can be preexisting and amplified, but sometimes more serious problems such as paranoid or psychotic behavior occurs. Stress and events that ends up with stress are assumed to be the main cause

**TABLE 3**  
THE FREQUENCY AND INTENSITY OF CERTAIN PSYCHOLOGICAL SYMPTOMS BETWEEN WOMEN WITH NORMAL AND PATHOLOGICAL COURSE OF PREGNANCY

Answer	The normal course of pregnancy							
	0		1		2		3	
	N	%	N	%	N	%	N	%
Somatization	433	45.39	351	36.79	134	14.05	36	3.77
Anxiety	314	49.45	201	31.65	90	14.17	30	4.72
Obsessive-compulsive symptoms	475	59.45	259	32.42	51	6.38	14	1.75
Depression	576	55.87	329	31.91	101	9.80	25	2.42
Non-specific symptoms	554	57.89	288	30.09	90	9.40	25	2.61
Psychotic characteristics	582	73.12	143	17.96	62	7.79	9	1.13
Paranoia	322	67.08	123	25.63	26	5.42	9	1.88
nep	337	70.65	110	23.06	26	5.45	4	0.84
Phobias	408	85.00	52	10.83	15	3.13	5	1.04
sim	275	49.46	201	36.15	58	10.43	22	3.96

  

Answer	The pathological course of pregnancy							
	0		1		2		3	
	N	%	N	%	N	%	N	%
Somatization	307	33.15	260	28.08	181	19.55	178	19.22
Anxiety	155	24.64	247	39.27	130	20.67	97	15.42
Obsessive-compulsive symptoms	271	33.66	331	41.12	126	15.65	77	9.57
Depression	383	36.51	454	43.28	130	12.39	82	7.82
Non-specific symptoms	343	35.36	452	46.60	105	10.82	70	7.22
Psychotic characteristics	456	55.88	305	37.38	47	5.76	8	0.98
Paranoia	209	42.57	249	50.71	24	4.89	9	1.83
nep	234	47.76	220	44.90	32	6.53	4	0.82
Phobias	315	64.29	144	29.39	29	5.92	2	0.41
sim	204	36.76	185	33.33	55	9.91	111	20.00

**TABLE 4**  
THE RESULTS OF LABORATORY FINDINGS IN WOMEN GROUPED BY BODY WEIGHT

Variable ( $\bar{X}\pm SD$ )	Body weight			F	p
	Normal	Overweight	Obesity		
Glucose (mmol/L)	4.34±0.73	4.49±0.98	4.95±1.18	4.70	0.010 <sup>1</sup>
Triglycerides (mmol/L)	2.37±0.85	2.74±1.20	2.77±1.13	1.87	0.158
Cholesterol (mmol/L)	6.95±2.02	6.81±1.35	6.80±1.23	0.13	0.876
HDL (mmol/L)	1.62±0.39	1.55±0.55	1.45±0.38	1.46	0.235
LDL (mmol/L)	4.01±1.01	4.02±0.91	4.22±0.94	0.73	0.484

One way ANOVA; <sup>1</sup> Post hoc Sheffe test, p=0.017

and trigger of these psychological symptoms and disorders during pregnancy. According to the literature it seems that events form early childhood, family relations and support during pregnancy can have the great influence on the development of psychological symptoms and disorders<sup>10-12</sup>.

When filling out the form given in our study, pregnant women have chosen some items as moderately strong or

very strong. Those with normal development of pregnancy have given 40.6% of answers 1,2,3,4. Pregnant women with pathological pregnancy have answered 61%, which represents a significant statistical difference. In most cases these were the symptoms of somatization: headache, dizziness and faint, pain in specific areas of body, feeling of weakness in arms and legs etc., symptoms of obsessive-compulsive dimension: memory and concen-



tration problems, the symptoms of depression: weakness and fatigue, mood changes and excessive care for everything, anxiety: nervousness and inner unrest, non-predictable unprovoked fear, symptoms of phobic anxiety: fear of leaving closed spaces, agoraphobia etc. Pregnant women have manifested fewer symptoms of hostility, paranoid behavior and psychosis and have more frequently manifested sleeping problems and difficulties, restless sleeping, increased appetite<sup>15</sup>. In the course of study performed in India and published in 2005, the incidence of psychological disorders was 10–16%, postpartum 30–50%. In a study performed in Sweden, the incidence of psychological disorders during pregnancy was found to be 6.4%<sup>16</sup>. This indicates that socio-demographic factors (life conditions, life standard, better health-care, education etc.) reduce the incidence of psychological disturbances. A study performed in 2003 found 14 to 21% prevalence in psychological disturbances during the second trimester of pregnancy. Similar results were obtained in mentioned studies of foreign authors. Several researches have been performed in Bosnia and Herzegovina on the topic: woman, pregnancy and stress. Based on the sample of 147 pregnant women, Nakić Zulčić et al. found that mothers which had more severe traumatic experiences manifest higher level of stress, and they are diagnosed with statistically significantly higher level of neurotic characteristics (anxiety, phobias, depression, obsessive-compulsive characteristics) compared to mothers which were exposed to the lower levels of stress<sup>17</sup>. The group of authors has investigated wartime and postwar psychological disturbances in women in Bosnia and Herzegovina and their finding was that women which experienced more severe stress situations, had more psychological disturbances compared to women with less traumatic experiences<sup>18</sup>.

Among the examined groups of mothers, mothers which had prior delivery with complications, manifested stronger psychological symptoms compared to those mothers with normal prior delivery (somatization, obsessive-compulsive symptoms, anxiety and non-specific symptoms)<sup>19,20</sup>. Mothers with pathological CTG record manifested statistically significant difference in all examined psychological symptoms. Mothers with pathological ultrasound result showed statistically significant difference in level of psychological disturbances and symptoms. All CTG records were registered in pathological pregnancies (16 CTG records). All mothers had ultrasound examination with normal results for all mothers with normal pregnancy and 68 mothers (82.9%) with pathological pregnancy, and pathological results for 14 mothers (17.1%) with problematic pregnancy. 5 mothers (6.3%) with normal pregnancy and 14 mothers (17.1%) with pathological pregnancy had prior delivery with complications. A prospective study performed in Sweden (625 mothers, 2006) found statistically higher incidence (6.4%) of psychological disturbances in mothers that had obstetrical complications, surgeries, bleedings etc., compared to mothers with normal development of pregnancy (4.5%)<sup>19</sup>. Another study which demonstrates the inci-

dence of antenatal depression and anxiety in mothers, related to socio-demographic and obstetrical clinical parameters, found significantly higher incidence of mentioned disorders in mothers which had obstetrical complications during pregnancy, and in mothers with monoamniotic twin pregnancy<sup>20</sup>. Mothers with moderate obesity and extreme obesity manifested much higher levels of mentioned parameters. Such results have also been obtained in studies of American authors.

Potential premature delivery is the most frequent cause of hospitalization in our sample (N=82) and generally at Department of pathology of Pregnancy with 28 mothers (34%) in the examined sample. The incidence of premature deliveries in Croatia in period 1981–1998 was 6.7–9.1%, with premature delivery being the cause of around 20% of antenatal visits. This is followed by hypertensive disorders in pregnancy, with 28 mothers (4%) treated. The incidence of pregnancies with hypertensive complications at Department of Gynecology and Obstetrics, Mostar University Hospital Center in period 1995 – 1999 was 6.5%, which does not differ from data on the incidence of hypertension disorders in Western European countries and pre-eclampsia in USA. The highest incidence of hypertensive disorders in Bosnia and Herzegovina was in period 1992 – 1995, which can be correlated with wartime and postwar life conditions in Bosnia and Herzegovina. The highest percentage of hypertensive disorders was recorded in 1995 (8.7%), almost half of mothers (48.6%) being primigravida. The most frequent causes for hospitalization of mothers at Department of Pregnancy Pathology were: potential premature delivery, hypertensive disorders, bleeding during the second and third trimester of pregnancy and diabetes in pregnancy (87.8%).

In our examined sample for the diagnosis of the existence of metabolic syndrome in mothers, we have taken three or more criteria according to the WHO<sup>21</sup>. Mandatory criterion was elevated morning level of glucose >6.1 mmol/L (110 mg/dL) and we found elevated levels of triglycerides and cholesterol in mothers. Elevated values were found in moderately obese and obese mothers with higher BMI. These mothers take in more than 60% of carbohydrates and manifest significantly higher level of psychological disturbances in pregnancy<sup>22</sup>. Obesity, diabetes and hypertension are significantly more frequent in pathological pregnancies<sup>23</sup>. A significant statistical difference in the severity of psychological symptoms and disturbances was found in these 19 mothers ( $p < 0.001$ ), in all eight examined dimensions<sup>24</sup>.

Statistically, a pregnancy with pathological development significantly increases the incidence of psychological symptoms. The nourishment with higher intake of carbohydrates increases glucose, triglyceride and cholesterol levels in blood, weight, and the metabolic syndrome incidence in pregnancy. It was determined that all these changes additionally reinforce psychological symptoms which can result in different psychological disorders in pregnancy, especially if it has pathological course.

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V. Bjelanović

Mostar University Hospital Centre, Department of Gynecology and Obstetrics, Kralja Tvrtka bb, 88000 Mostar, Bosnia and Herzegovina  
e-mail: vedranbjelanovic@yahoo.com

## PATOLOŠKA TRUDNOĆA I PSIHIČKI SIMPTOMI U ŽENA

### SAŽETAK

Trudnoća je praćena brojnim fiziološkim, organskim i psihičkim promjenama i poremećajima, koji se mogu i pogoršati u trudnoći praćenoj komplikacijama, posebice ako se radi o ženama s patologijom trudnoće. Cilj rada je bio utvrditi i analizirati izraženost, učestalost i jačinu psihičkih simptoma i poremećaja u žena s patologijom trudnoće i usporediti ih s trudnicama u kojih je tijek trudnoće uredan. Istraživanje je odobreno od strane Etičkog povjerenstva Kliničke bolnice Mostar, a provedeno je u skladu s Helsinškom deklaracijom i načelima dobre kliničke prakse. Presječna prospektivna studija provedena je na Odsjeku patologije trudnoće Odjela za ginekologiju i porodiljstvo Kliničke bolnice Mostar. Skupinu je činilo 82 trudnice s poremećenim tijekom trudnoće, a kontrolna skupina su 80 trudnica s normalnim tijekom trudnoće. Istraživanje je provedeno od 9. mjeseca 2007. do 8. mjeseca 2008. godine u KB Mostar. Trudnicama su rađene standardne i laboratorijske pretrage, UZV, CTG te dodatne pretrage u trudnoći s komplikacijama. Trudnice su ispunjavale sociobiografski, opstetričko-klinički i psihološki SCL 90-R upitnik. Trudnice s patologijom trudnoće pokazivale su statistički značajno više psihičkih simptoma u odnosu na trudnice s normalnom trudnoćom ( $p < 0,001$  do  $p = 0,004$ ). Učestalost i jačina psihičkih simptoma i poremećaja statistički je značajno veća u patološkoj trudnoći (61%/40,6%). Statističkom obradom podataka primijećena je statistički značajno veća izraženost psihičkih poremećaja u trudnica s osnovnom školom ( $p = 0,050$ ), trudnica koje uzimaju više od 60% ugljikohidrata (Hi-kvadrat test  $p = 0,001$ ), trudnica s patološkim CTG zapisima ( $p < 0,001$ ), trudnica s patološkim ultrazvučnim nalazom ( $p < 0,001$  do  $0,216$ ) i trudnica s umjerenom pretiuloću i pretiuloću ( $p = 0,046$ ). Body mass indeks prije trudnoće (BMI) u žena s normalnim tijekom trudnoće je niži ( $p = 0,002$ ), a veća razina GUK-a, triglicerida, kolesterola, HDL i LDL ( $p = 0,017$ ). Krvni tlak je statistički značajno viši u trudnica s patološkom trudnoćom ( $p < 0,001$ ). U 19 trudnica u patološkoj trudnoći nađeni su kriteriji za dijagnozu metaboličkog sindroma, te kod njih nađena statistički značajno viša pojavnost psihičkih simptoma i poremećaja u trudnoći u odnosu na trudnice bez dijagnoze metaboličkog sindroma ( $p < 0,001$ ). Istraživanjem je utvrđeno da je 87,8% trudnica hospitalizirano zbog prijetećeg prijevremenog poroda, hipertenzivnih poremećaja u trudnoći i dijabetesa u trudnoći, te krvarenja u drugom i trećem tromjesečju trudnoće.