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INFLUENCE OF VARIANTS OF ANESTHESIA ON CONTRACTIVE ABILITY OF MYOMETRY AND CONDITION OF FETUS IN CONDITIONS OF PREMATURE LABOR

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СОКРАТИТЕЛЬНАЯ СПОСОБНОСТЬ МИОМЕТРИЯ И СОСТОЯНИЕ ПЛОДА В УСЛОВИЯХ ПРЕЖДЕВРЕМЕННЫХ РОДОВ И РАЗЛИЧНЫХ ВАРИАНТАХ АНЕСТЕЗИИ

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ANNOTATION

On the basis of a random sample, 150 women in labor with spontaneous preterm labor were selected into three clinical groups, comparable according to the ASA, the Fisher scale, and a number of anthropometric parameters. In the main group (n = 69), single-stage sacral anesthesia with 0.2% bupivacaine solution was used, in the 1st comparison group (n = 49), prolonged epidural anesthesia with 0.125% bupivacaine solution was performed, and in the 2nd comparison group (n = 32), labor was performed with using pudendal anesthesia and subcutaneous injection of 2% promedol. In these groups, the contractility of the myometrium, cardiotocogram, biochemical parameters of hypoxia in the blood of the umbilical cord of the fetus, Fisher and Apgar scores were assessed. It was revealed that the proposed variant of sacral anesthesia has the most favorable effect on these parameters in comparison with other studied methods.

АННОТАЦИЯ

На основе случайной выборки в три клинических группы отобраны 150 рожениц с самопроизвольными преждевременными родами, сопоставимые по ASA, шкале Fisheги ряду антропометрических параметров. В основной группе (п=69) применялась одномоментная сакральная анестезия 0,2% раствором бупивакаина, в 1 группе сравнения (п=49) проводилась продленная эпидуральная анестезия 0,125% раствором бупивакаина, а во 2 группе(п=32) сравнения роды велись с использованием пудендальной анестезии и подкожной иньекции 2% промедола. В этих группах проанализированы параметры системной гемодинамики, родовой травматизм и число оперативных родов. Выявлено, что предложенный вариант сакральной анестезии, обеспечивая адекватную ноцицептивную защиту, не вызывает клинически значимой депрессии параметров системной гемодинамики; при этом снижается родовой травматизм и количество оперативных родов.

Key words: premature birth, fetal hypoxia, regional anesthesia, myometrial contractility.

Ключевые слова: преждевременные роды, гипоксия плода, региональная анестезия, сократительная способность миометрия

Under the influence of labor pain, the parameters of the mother's homeostasis and the dynamics of the labor act change (1, 2). These changes are reflected in the state of the uteroplacental blood flow and affect the intrauterine state of the fetus and the course of the early antenatal period (3, 4).

Research task. To determine the degree of influence of various types of anesthetic protection on the contractility of the myometrium, the state of the fetus and early antenatal period.

Material and method

150 women in labor were randomly selected into three clinical groups in accordance with the following

criteria: 1) gestational age 28-36 weeks; 2) spontaneous onset of premature birth; 3) risk class in accordance with the ASA classification, the sum of the fetal state of the fetus according to Fisher is not less than 6 points.

Depending on the type of anesthesia, the following groups were identified: the main group (n = 69) in which one-stage sacral anesthesia (SA) was performed with a 0.2% bupivacaine solution for the purpose of anesthetic protection, 1 comparison group (n = 49), in which an extended epidural anesthesia (PEA) with 0.125% bupivacaine solution; Comparison group 2 (n = 32), where labor was carried out using pudendal anesthesia and subcutaneous injection of 2% promedolsolution. The groups were comparable in terms of age, height, body weight, gestational age, physiological ASA status.

The study did not include women in labor whose condition was decompensated in the course of pregnancy and concomitant diseases, with ASA risk class 3 and higher; and also in the presence of severe intrauterine fetal hypoxia, with a Fisher score of less than 6 points, as this could affect the results of the study.

The evaluation of the research data was carried out at stages: 1 stage - before the beginning of anesthesia; stage 2 - 40 minutes after the introduction of local anesthetic; stage 3 - the end of the 1st stage of labor.

The contractility of the myometrium in women in labor was assessed by the amplitude (arbitrary units) and duration of contractions (sec).

To assess the state of the fetus in the intrapartum period, the recording and analysis of the cardiotocogram (CTG) were used: the main level of the fetal heart rate (FHR); the number, amplitude, duration, nature of ascelerations and descelerations of FHR. FHR recording and analysis were performed using the Centaur software and hardware complex (Russia) at the selected stages of the study.

Indicators of cortisol were determined by the enzyme-linked immunosorbent method using a Bio-tekinstruments, inc.Exl. 800 "(USA). The glucose content was determined in the blood from the umbilical cord by the glucose oxidant method using an optical photometer 50-10 (Russia). In the same samples, the total activity of lactate dehydrogenase (LDH) was determined without isolating isoenzymes on a biochemical analyzer "CobasEmira" (Switzerland).

Results

The contractility of the myometrium at the stages of anesthesia in the studied groups of parturient women is presented in Table 1.

The greatest amplitude of contractions was observed in the main group of women in labor at the 2nd stage of the study, which exceeded the amplitude of contractions in the 1st comparison group by 35.4% ($p < 0.05$), in the second - by 25.9% ($p < 0.05$). At the third stage of the study, the ratio of the values remained: in the main group of women in labor, the amplitude was 28.7% ($p < 0.05$) more than

Table 1

The amplitude and duration of contractions in the studied groups of women in labor

	Stages survey		
	1 stage	2 stage	3 stage
	Main	group	
Contraction amplitude (units)Duration (sec) Regularity	30,37±0,64 38,9±0,9 Irregular	42,4±0,9* 50,4±1,3* Regular	41,8±1,08* 49,7±1,12* Regular
	1	group	comparing
Contraction amplitude (units)Duration (sec) Regularity	32,37±0,64 32,9±0,9 Irregular	27,4±0,9* 42,4±1,3* Regular	29,8±1,05* 41,7±1,12* Regular
	2	Regular	comparing
Contraction amplitude (units)Duration (sec) Regularity	22,37±0,64 35,9±0,9 Irregular	31,4±0,9* 39,4±1,3* Regular	26,8±1,08* 38,3±1,12 Regular

*p<0,05reliable difference from the previous stage

in group 1 and 35.9% ($p < 0.05$) more than in the second. The duration of contractions was noted in the main group at stages 2 and 3 of the study. At the same time, the duration of contractions in it was 18.9% longer than in the 1st comparison group ($p < 0.05$) and by 27.9% more ($p < 0.05$) than in the 2nd comparison group ($p < 0,05$). The same ratio remained at the 3rd stage of the study: the duration of contractions in the main group was 19.2% ($p < 0.05$) higher than this value in the 1st comparison group and by 29.8% ($p < 0.05$) - in the 2nd comparison group.

The level of contractility of the myometrium at the stages of preterm labor under the conditions of various options for anesthetic protection undoubtedly influenced the duration of labor. An analysis of the duration of labor in the studied groups of women in labor is presented in Table 2.

Table 2

Duration of labor in the study groups of parturient women (hour)

	Main group	1 gr.comparing	2 gr. comparing
1 period	6,05±0,13	7,25±0,16	6,9±0,21
2 period	1,05±0,02*	1,12±0,03*	1,09±0,04*
3 period	0,33±0,02*	0,35±0,02*	0,34±0,02*
Total duration	7,43±0,14	8,77±0,1	8,33±0,2

*p<0,05 in comparison with the previous stage

Summing up the preliminary result, it should be noted that under the influence of sacral anesthesia in the main group of parturient women there was a decrease in the duration of labor by 15.3% (p <0.05) than in group 1 and by 10.8% (p <0.05) than in the 2nd group of comparison, due to the increase in the duration and amplitude of contractions.

Table 3 presents the data of the analysis of cardiotocography at the stages of anesthesia in the studied groups of women in labor.

The results of the study show that there are no significant differences between the initial indicators reflecting the number of latedecelerations (p> 0.05). In women in labor of the main group, the indicator of the number of late descelerations decreased at the 2nd stage of the study in comparison with the initial data by 55.4% (p <0.05), at the 3rd stage the number of late descelerations increased compared with the previous stage (5.9%, p <0.05), while there was a significant difference with the initial level (52.7%, p <0.05). In women in labor of the 1st comparison group, the number of late descelerations decreased at the study stages by 56.2% and 2.01%, respectively (p <0.05). In comparison group 2 at the

Table 3

Assessment of the intrauterine state of the fetus according to CTG data in parturient women in the study groups

	Stages	survey	
	1 stage	2 stage	3 stage
	Main	group	
CTG(scores)	6,4±0,1	7,91±0,15*	7,73±0,16*
FSR (p./min)	145,3±7,5	135,2±5,4	137,5±5,4
The number of late descelera-tions(during. 30 min)	3,81±0,11	1,7±0,2*	1,8±0,12*
	1group	comparing	
CTG(scores)	6,7±0,1	7,41±0,15*	7,53±0,16*
FSR (p./min)	149,3±7,5	143,2±5,4	140,5±5,4*
The number of late descelera-tions(during. 30 min)	3,7±0,11	1,99±0,2*	1,95±0,12*
	2 group	comparing	
CTG (scores)	6,61±0,19	6,51±0,15	6,54±0,25
FSR (p./min)	150,3±7,5	146,2±5,4	149,5±5,4
The number of late descelera-tions(during. 30 min)	3,9±0,11	4,1±0,2	4,13±0,12

*p<0,05 reliable difference from the original data

study stages, there was a slight increase in late descelerations by 5.12% and 0.73%, respectively, the difference between the initial indicator and the indicator at the end of labor was 5.89% (p <0.05).

The number of late descelerations by the end of the 1st stage of labor in women in labor in the main group was 56.4% lower (p <0.05) than in the 2nd comparison group and 7.7% lower (p <0.05) than in the 1st group. comparison group. Summing up, we can say that regional methods of labor pain relief affect to a greater extent the deceleration of the SDF during labor, stabilizing the SDF and preventing its fluctuation. The administration of narcotic analgesics does not significantly affect the changes in FSR during labor.

Table 4 shows the biochemical parameters of stress measured in the blood from the umbilical cord of newborns, as well as the assessment of the intrauterine state of the fetus according to Fisher.

Table 4

Assessment of the fetal state of the fetus according to Fisher and biochemical parameters in the blood of newborns

	Main group	1 comparing	2 comparing
Mark	1 6,4	Stage 6,7	 6,61
по Fisher	2 7,91	stage 7,41	 6,51
(scores)	3 7,83	stage 7,53	 6,54
LDH activity (mmol / l h)	593,5	657,3	787,1
Cortisol (nmol / L)	743,4	735,3	876,0
Glucose (mmol / L)	2,99	2,9	3,1

When analyzing the data from Table 4, it can be seen that there are no significant differences between the initial indicators reflecting the assessment of the intrauterine state of the fetus (p> 0.05). In women in labor of the main group, the Fisher score increased at the 2nd stage of the study in comparison with the initial data by 27.6% (p <0.001), at the 3rd stage it decreased by 1.01% (p <0.05) as compared with the previous stage, with this remained a significant difference compared with the initial level (26.2%, p <0.05). In women in labor of the 1st comparison group, the Fisher score increased at the research stages by 10.6% (p <0.05) and 1.6% (p> 0.1), respectively, the difference from the initial level was 12.4% (p <0 , 05). In the second group of comparison at the stages of the study, there were no significant changes in the Fisher estimate.

The Fisher score at the 2nd stage of the study among women in labor in the main group was 21.5% higher (p <0.05) than in the 2nd comparison group and 6.7% higher than in the 1st comparison group. By the end of the 1st stage of labor, this difference was 19.7% and 3.98%, respectively. To summarize, it can be said that regional methods of labor pain relief are most influenced by the Fisher score. This happens, most likely, due to an improvement in tissue perfusion and regulation of labor. The introduction of narcotic analgesics does not significantly affect the change in the intrauterine state of the fetus.

Comparing the data of biochemical studies, reflecting the level of stress experienced by the fetus during childbirth, the following can be noted: in newborns in the main group, LDH activity was 10.75% lower than in the 1st comparison group (p <0.05). In comparison group 2 LDH activity was significantly higher than in the main group and in comparison group 1 by 32.7% and 19.75%, respectively (p <0.05). There were no significant differences in blood glucose in newborns in all clinical groups (p> 0.05). The level of cortisol in the main group and in the 1st comparison group did not differ significantly (p> 0.05). In newborns in the 2nd comparison group, the cortisol index was higher than in the main group and in the 1st comparison group by 21.1% and 19.13%, respectively (p <0.05).

All newborns were assessed using the Apgar scale. In the main group, the score (p <0.05) at 1 minute was 7.31 ± 0.75, and at the fifth - 8.01 ± 0.98. In the 1st comparison group for 1 min - 7.27 ± 0.67 (p <0.05), for 5 min - 7.83. In comparison group 2, the assessment (p <0.05) at 1 minute was 7.09 ± 0.15, at 5 minutes - 7.83 ± 0.18.

Findings

1. Sacral anesthesia for anesthesia of preterm labor does not affect the intrauterine state of the fetus, which manifested itself as an increase in Fisher score by 27.6% compared to the baseline. In the group of women in labor, where anesthesia was performed using PEA, the increase in the estimate was 10.6%, and these changes persisted until the end of the 1st stage of labor. A lower level of intrauterine hypoxia of the fetus was confirmed by the LDH activity, which in the main group was 10.75% lower than in the first comparison group and by 32.7% than in the second. The quality of early cardiorespiratory adaptation was characterized by an Apgar score 5 minutes after birth: which in the main group was 9.6% higher than in the first comparison group and 11.2% higher than in the second comparison group.

2. SA is a pathogenetically substantiated method of pain relief in preterm labor, given its effect on the contractile function of the myometrium, which manifested itself in an increase in the duration and amplitude of contractions by 40% from the initial level. This led to a 15.3% and 10.8% reduction in the duration of labor compared with other groups of women in labor.

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