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HEMODYNAMICS OF PREGNANT WOMEN WITH PREECLAMPSIA RESOLVED BY CESAREAN SECTION

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Abstract

This article presents the results of an assessment of hemodynamic parameters using various anesthesia methods in pregnant women with comorbidities undergoing abdominal delivery. Regional anesthesia does not significantly affect systemic and central hemodynamics in parturient women. Regional anesthesia during cesarean section is effective and safe.

Study Objective: To study the effects of various anesthesia methods on the hemodynamic parameters of women in labor with preeclampsia.

Materials and Methods: The study was based on the results of a prospective clinical examination of 60 pregnant women with severe preeclampsia who delivered by cesarean section. Depending on the type of anesthesia used during abdominal delivery, all women in labor were divided into 2 groups. Women in Group 1 (n = 40) underwent abdominal delivery under SA, while women in Group 2 (n = 20) underwent TVA with mechanical ventilation. The control Group 3 consisted of 50 relatively healthy women who delivered by cesarean section.

Results: Studies have shown that spinal anesthesia, when used with strict adherence to technique and MA dosages, does not significantly impact central hemodynamics throughout the perioperative period and can be administered to pregnant women with severe preeclampsia.

Conclusion: Spinal anesthesia has a more positive effect on central hemodynamics and adequate protection from surgical stress compared to TVA with mechanical ventilation and is the safest anesthesia method for abdominal delivery in pregnant women with severe preeclampsia.

Key words

cesarean section, central hemodynamics, regional anesthesia, total intravenous anesthesia, artificial ventilation.

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Relevance. Research into the choice of anesthetic technique for cesarean section in modern obstetrics is particularly relevant, as it should adequately protect the pregnant woman from surgical stress and create optimal conditions for fetal adaptation in the preoperative period [1]. The basis for choosing anesthetic techniques for obstetric surgery is the principle of a differentiated approach, which takes into account the nature of the obstetric and extragenital pathology, indications, degree of urgency, and scope of the surgical intervention. Evaluation of these features allows us to select the most adequate and safe method of anesthetic protection of the body of a pregnant woman and fetus from surgical stress [3,4,5]. A study devoted to the study of the influence of various methods of anesthesia on the main parameters of hemodynamics in patients with severe preeclampsia during abdominal delivery, carried out by Kinzhalova S.V. and co-authors [2], showed that in the group of patients with spinal anesthesia, a moderate decrease in blood pressure, an increase in stroke volume and a decrease in total peripheral vascular resistance were noted, than in the group of pregnant women with severe preeclampsia who underwent cesarean section under general anesthesia. This category of patients showed tachycardia, arterial hypertension, decreased stroke volume at the prenatal stage, and stabilization of indicators only at subsequent stages of the study, but adequate uteroplacental perfusion was observed in both groups.

Material and methods. The study is based on the results of a prospective clinical examination of 60 pregnant women with severe preeclampsia who were delivered by cesarean section. Depending on the type of anesthesia used during abdominal delivery, all women in labor were divided into two groups. Pregnant women in Group 1 (n = 40) underwent abdominal delivery under SA, while those in Group 2 (n = 20) underwent TVA with mechanical ventilation. The control group III consisted of 50 relatively healthy pregnant women who underwent surgical delivery for various obstetric indications: 30 of these pregnant women underwent surgery using spinal anesthesia - group III (A) and 20 pregnant women under TVA with mechanical ventilation - group III (B). All patients with severe PE underwent cesarean section at 32-39 weeks.

Methodology: Taking into account the degree of preeclampsia, all surgeries in groups I and II were performed planned or urgently with preoperative preparation for 2-4-6-12 hours. Study stages: 1st stage - preoperative, 2nd stage - during intubation or administration of local anesthetic, 3rd stage - during fetal extraction (during surgery), 4th stage - 24 hours after surgery. The local anesthetics most frequently used by us were 2% lidocaine solution at a dose of 0.7-1 mg / kg (50-80 mg) or 0.5% bupivacaine solution at a dose of 0.15-0.2 mg / kg (12.5-20 mg). To

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increase the anesthetic's baricity and improve the block's control, 0.3-0.5 ml of 40% glucose solution was added to 2% lidocaine. For induction of anesthesia, 1% propofol solution was administered intravenously by microbolus injection at a dose of 2.5-2.75 mg/kg. Precurarization was not performed. After loss of consciousness, ditilin was administered intravenously by bolus injection at a dose of 1.5-2.0 mg/kg.

Study results: Our research found that women in Group I (SA) reported psychophysical comfort even during the surgery compared to women in Group II, who underwent TVA with mechanical ventilation. They reported satisfaction with their preserved consciousness, which allowed for early visual and emotional contact between mother and child, even during the surgery. They actively expressed interest in their own well-being and the health of their child, napped in a relaxed position, and awoke immediately when called.

Table No. 1

CGD indicator	I-этап	II-этап	III-этап	IV-этап
HR, min. (M±m)	100,58 ±1,45	101,44±1,03	91,7±1,07	80,96 ± 0,66
BP, mmHg (M±m)	160,4±1,74	140,74±1,54	129,48±1,69	133,3±1,2
BP, mmHg (M±m)	104,5±0,99	85,98±1,67	78,47±1,77	85,52±1,02
SBP, mmHg (M±m)	122,83 ±1,19*	103,92±1,5**	95,04 ±1,69	101,32 ± 0,91
CI, L/min*m2 (M±m)	3,04±0,08	3,68±0,13	3,48±0,11	2,8±0,08
SI, ml/m2 (M±m)	29,7±0,73	36,4±1,19	37,92 ±1,18	34,14 ± 0,8
TPVR, kPa*s/L (M±m)	337,98±7,11 *	245,44±8,76**	216,26±9,31	246,12 ± 5,66

*Note: main group (n=40) where SMA was used

Table 1, which summarizes the main group (n=40) of women undergoing spinal anesthesia, shows that in the early postoperative period, patients in Group I (SA) experienced a lower heart rate and lower SBP than those in Group II (VA with mechanical ventilation). This can be explained by the high level of anesthesia, which facilitated capillary dilation and improved peripheral blood flow, as well as high organ perfusion due to reduced preload.

Table No. 2

CGD indicator	I-этап	II-этап	III-этап	IV-этап
HR, min. (M±m)	96,2±2,49	115,23±2,06	103,1±1,66	85,03 ±1,18
BP, mmHg	155,83±2,28*	166,83±2,36*	152,83± 2,39	138,2±1,57

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(M±m)				
BP, mmHg (M±m)	102,5±1,58	106,33±1,28	94,83±1,91	88,47 ± 1,08
SBP, mmHg (M±m)	119,73±2,22	128,63±1,53*	112,03±2,11	105,27 ±1,26
CI, L/min*m2 (M±m)	3,03±0,13	3,7±0,17	3,56±0,14	2,95±0,11
SI, ml/m2 (M±m)	32,23±1,23	32,06±1,1	34,66± 1,37	34,5 ± 1,14
TPVR, kPa*s/L (M±m)	321,9±10,54	285,1±8,85	281,7±10,87	85,03 ±1,18

*Note: main group (n=20), where TVA with artificial ventilation was used

In Table No. 2, where TVA with artificial ventilation was used, it was possible to achieve stabilization of central hemodynamic parameters by the third stage of anesthesia (after the extraction of the fetus) and the introduction of standard doses of anesthesia drugs and narcotic analgesics.

Table No. 3

CGD indicator	I-этап	II-этап	III-этап	IV-этап
HR, min. (M±m)	99,33± 6,3	96,23±1,85	88,4 ± 1,5	78.57±0,81
BP, mmHg (M±m)	109,67±2,12	109,67 ±2,04	105,8 ±1,7	113,4±1,64
BP, mmHg (M±m)	81,3±1,42	65,23±1,73	61,8± 1,17	70,1±1,2
SBP, mmHg (M±m)	94,57±1,67	79,6±1,72	75,96± 1,34	82,87± 3,6
CI, L/min*m2 (M±m)	3,31±0,16	3,72 ±0,11	3,55 ±0,08	2,98±0,13
SI, ml/m2 (M±m)	34,85±1,17	39,5 ±1,18	40,05± 1,23	36,65±1,17
TPVR, kPa*s/L (M±m)	226,0±8,84	175,75 ±7,92	163,66 ± 8,85	187,3 ±7,26

*Note: control group (n=50)

In the control group, no significant changes from the initial state were observed, as shown in Table No. 3, since this group included women in labor who did not have concomitant pathology, but who gave birth surgically due to obstetric indications.

Conclusion: Spinal anesthesia has a more positive effect on central hemodynamics, as well as on adequate protection from surgical stress compared to

TVA with mechanical ventilation and is the safest method of anesthesia for abdominal delivery in pregnant women with severe preeclampsia.

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