COMPARATIVE ANALYSIS OF SPINAL ANESTHESIA WITH QL BLOCK IN GYNECOLOGICAL PATIENTS WITH HYPERTENSION AND CHRONIC CIRCULATORY FAILURE

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Abstract: *The aim was to evaluate the clinical course of spinal anesthesia combined with a QL block in patients with arterial hypertension and chronic heart failure. The study included 68 patients undergoing elective gynecological surgery. Hemodynamics, respiratory function, analgesia, and complications were assessed.*

Spinal anesthesia with QL block provided stable hemodynamics, preserved spontaneous breathing, and effective analgesia. Patients with chronic heart failure showed greater hemodynamic variability. The QL block prolonged analgesia and allowed dose reduction of intrathecal anesthetic.

This technique is effective and safe when individualized according to cardiovascular functional reserve.

Keywords: *spinal anesthesia, QL block, chronic heart failure, arterial hypertension, hemodynamics.*

Introduction Modern anesthesiology is focused on a personalized approach, due to the increasing number of patients with cardiovascular pathologies [1,2]. The choice of anesthesia for patients with chronic circulatory failure and hypertension, who differ in various types of hemodynamics and adaptive capabilities, is of particular importance [3,4].

In chronic circulatory insufficiency, a hypokinetic type of hemodynamics with limited functional reserve is formed [5], while in hypertension, the eukinetic type is more frequently observed with possible hidden regulatory disorders [6]. Despite similar clinical manifestations, adaptive reactions differ and determine the response to surgical stress [7].

The functional reserve of the cardiovascular system and its ability to mobilize are of key importance [8,9]. Its assessment, including functional tests, allows for the identification of hidden adaptation disorders [10]. Neuroendocrine stress response plays a significant role, affecting hemodynamics and perfusion [11].

Regional anesthesia methods contribute to a reduction in stress response, while general anesthesia is accompanied by more pronounced neuroendocrine activation [12].

Purpose of the study: to compare the clinical course of SA combined with QL block in gynecological patients with hypertension and chronic circulatory insufficiency, taking into account functional reserve.

Materials and methods: the study was conducted as a prospective comparative clinical-instrumental study and included 68 gynecological patients who underwent scheduled surgical interventions (hysterectomy and reconstructive-plastic surgeries on pelvic organs).

Depending on the nosological form, the patients were divided into two groups: the hypertensive group (n=31) - with hypertension; the chronic circulatory failure group (n=37) - with chronic circulatory failure.

The average duration of surgeries was 138.1±6.9 minutes in the GB group and 146.4±19.4 minutes in the CCF group. All interventions were performed in a planned manner.

Anesthesiological support was provided in the form of balanced spinal anesthesia combined with bilateral QL block. Spinal anesthesia was performed by subarachnoid administration of a 0.5% bupivakaine solution in a dose of 7.5 mg. The QL block was performed under ultrasound navigation with the administration of a 0.25% bupivakaine solution at a dose of 2.5–3 mg/kg (30 ml on each side).

Assessment of the clinical course of anesthesia included:
• hemodynamic indicators (blood pressure, heart rate);
• external respiratory parameters (respiratory rate, SpO2);
• timing of sensorimotor block development;
• severity of analgesia;
• features of post-operative recovery;
• frequency and nature of complications.

Indicators were recorded at stages: before the start of anesthesia, after the block was performed, during the main stages of the operation, and in the early postoperative period.

Statistical processing of the data was carried out using standard methods of variational statistics. Quantitative indicators are presented as the mean value and standard deviation (M±SD). The significance of the differences was assessed using parametric and non-parametric criteria; the differences were considered statistically significant at $p<0.05$.

Discussion of the results: a comparative analysis of the clinical course of balanced spinal anesthesia combined with QL block in gynecological patients with hypertension (HD) and chronic circulatory failure (CCF) revealed significant differences due to the level of functional reserve.

Table 1.

Characteristics of surgical interventions

Indicator	HD (n=31)	CCF (n=37)
Operation duration (min)	138,1±6,9	146,4±19,4
Operation type	Reconstructive hysterectomy	Same
Nature of the intervention	Planned	Planned

As seen in Table 1, the groups were comparable in terms of the nature of surgical interventions. The average duration of surgeries was 138.1±6.9 minutes in the HD group and 146.4±19.4 minutes in the CCF group, which does not significantly affect the interpretation of hemodynamic and clinical indicators.

Table 2.

Intraoperative hemodynamics

Indicator	HD	CCF
Decrease in blood pressure (mmHg)	6,9	10–15
Change in heart rate (beats/min)	−1,8	−8–10
Hemodynamics	Stable	Moderately labile
Hypotension >20%	No	Unchecked

Analysis of intraoperative hemodynamics (Table 2) showed that in the HD group, the blood pressure decreases averaged 6.9 mmHg, whereas in patients with CCF, it was 10-15 mmHg. Similarly, the decrease in heart rate was less pronounced in GB (-1.8 bpm) compared to CCF (-8-10 bpm). Despite this, no episodes of clinically significant hypotension (>20%) were recorded in both groups, indicating high hemodynamic safety of the method.

The obtained differences reflect a decrease in adaptive potential in patients with CCF, which manifests as greater sensitivity to sympathetic blockade. In the GB group, hemodynamic stability is explained by the preserved contractile reserve of the myocardium.

Table 3.

External respiration indicators

Indicator	HD	CCF
SpO_2 (%)	96,8–97,3	94–95
Respiratory rate	Stable	Slightly reduced
Respiratory depression	No	No

Анализ показателей внешнего дыхания (таблица 3) показал, что уровень SpO_2 в группе ГБ составлял 96,8-97,3%, тогда как при ХНК 94-95%, при отсутствии признаков дыхательной депрессии в обеих группах. Это подтверждает безопасность методики при сохранённом самостоятельном дыхании даже на фоне сегментарной блокады.

Analysis of external respiratory parameters (Table 3) showed that the SpO_2 level in the HD group was 96.8–97.3%, whereas in CCF, it was 94–95%, with no signs of respiratory depression in both groups. This confirms the safety of the methodology while maintaining independent breathing even against the background of segmental blockade.

Table 4.

Post-operative indicators

Indicator	HD	CCF
Pain syndrome	Missing	Missing
Diuresis	Adequate	Adequate
Activation	Early	Early
Gastrointestinal restoration	Fast	Moderate

In the postoperative period (Table 4), all observations noted the absence of pain syndrome, adequate diuresis, and early activation of patients. Restoration of gastrointestinal function occurred faster in the HD group, whereas in patients with CCF, it was slower in nature, reflecting the impact of reduced functional reserve.

The regression of the motor block after 110–120 minutes while maintaining analgesia confirms the prolonged effect of the QL block. This allows for its consideration as an effective component of multimodal analgesia, compensating for a decrease in the intrathecal bupivakaine dose to 7.5 mg.

Analysis of complications showed high safety of the method: no intraoperative complications were observed, and post-puncture headache was recorded in 1 case in the HD group and 3 cases in the CCF group; it was mild in nature and did not require specific treatment.

Thus, the data in Tables 1-4 confirm that balanced spinal anesthesia combined with QL block ensures stable hemodynamics, effective analgesia, and a favorable course of the postoperative period. At the same time, patients with CCF exhibit greater variability in hemodynamic parameters and slower recovery, which is due to reduced functional reserve and requires individualized anesthesiological tactics.

Conclusion.

1. Balanced spinal anesthesia in combination with QL block ensures high hemodynamic stability and effective analgesia in gynecological patients with hypertension and chronic circulatory failure.

2. Patients with chronic circulatory insufficiency exhibit more pronounced variability in hemodynamic indicators (reduction of blood pressure to 10-15 mmHg, heart rate to −8-10 bpm), reflecting a limited functional reserve.

3. The use of a QL block allows for prolonged analgesia, reduces the dose of intrathecal anesthetic, and ensures a favorable course of the postoperative period while maintaining independent breathing.

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