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Optimisation of Preoperative Preparation in with Hypertension During Anaesthesia

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Abstract:

The optimization of preoperative preparation in hypertensive patients undergoing anesthesia is crucial for ensuring safe and effective perioperative management. This study investigates the hemodynamic responses during anesthesia in hypertensive patients undergoing cholecystectomy and evaluates the relationship between preoperative cardiovascular conditions and postoperative outcomes. The research was conducted on 58 patients aged 62 to 78 years, all with a history of arterial hypertension (AH), grouped based on the duration and severity of hypertension. Hemodynamic parameters, including heart rate, blood pressure, stroke index (SI), and oxygen saturation (SpO2), were monitored at different stages of anesthesia and surgery. The study found that the degree of hypertension and the preoperative cardiovascular state significantly influenced the intraoperative and postoperative hemodynamic stability. The use of central α2-adrenomimetics and combined anesthesia, particularly in patients with long-term hypertension, helped maintain stable hemodynamics during surgery. However, reflex tachycardia and variations in blood pressure were noted, emphasizing the need for individualized perioperative management. The findings highlight the importance of preoperative assessment to predict and optimize anesthesia outcomes in hypertensive patients.

Keywords: Hypertension, Preoperative preparation, Anesthesia, Hemodynamics, Cholecystectomy, Cardiovascular system, Elderly patients, Reflex tachycardia, α2-adrenomimetics, Anesthetic management, Postoperative recovery

Introduction

Nowadays, the choice of anaesthesia in geriatric surgery is becoming increasingly important. This is due to the fact that the average life expectancy of people is increasing every year.

Older patients are more likely to have diseases of the cardiovascular system. Such diseases include most often cerebral circulatory disorders, hypertension (up to 75.5%).

Arterial hypertension (AH) is the leading cause of mortality and disability in most Western countries, as well as the most common concomitant disease in surgical patients. Many experts believe that this condition develops in later adulthood, although blood pressure in these patients remains normal into their 30s. The severity of this condition increases with age. At the same time, one of the serious problems in this category of patients is the provision of adequate and safe anaesthetic management.

Persistent untreated arterial hypertension accelerates the development of atherosclerosis and causes damage to target organs. It is considered a major factor in the risk of cardiovascular, brain and renal disease. Management of patients with these diseases requires a high degree of professional skill on the part of the anaesthesiologist.

Adrenergic response to surgical stimulation, the effect of anaesthetics, tracheal intubation, ventilation, blood loss, changes in water-electrolyte balance and body temperature - all these factors create an additional load on the cardiovascular system during surgery in hypertensive patients. Drug preparation for anaesthesia is carried out according to the usual scheme, but taking into account the fact that these patients are more sensitive to sedatives. However, ideal and universal solutions to the problem of protecting the patient from surgical aggression in anaesthesiology are not yet known. The appearance of modern preparations for anaesthesia and improvement of surgical treatment results at the present stage of geriatric surgery development is seen in further improvement of preoperative preparation and intraoperative anaesthesia.

Purpose of work

To study haemodynamic reactions in patients with arterial hypertension during anaesthesia in cholecystectomy and in the nearest postoperative period. To reveal the relation of the course of the preoperative period with the initial state of the cardiovascular system in this category of patients.

Materials and methods

58 patients were studied in the surgical department of the multidisciplinary clinic of Samarkand Medical University. All patients underwent scheduled operations for cholecystectomies at the age from 62 to 78 years.

Depending on the method of anaesthesia used, the patients were divided into three groups; group 1 included 19 patients with history of AH (1-3 years) A/Dd > 90-95 mmHg, A/Dc > 140-160 mmHg, central α2-adrenomimetics (clanidine in the dose of 0.2-0.3 mg) were administered before the operation; general anaesthesia was performed under general endotracheal anaesthesia (nitrous oxide, barbiturates, NLA, fentanyl 0.002±0.0005 mg/kg, propofol 0.18±0.51 mg/kg. h, premedication included diazepam 0.13±0.04 mg/kg, atropine 0.005±0.0005 mg/kg. Group 2 included 19-patients, history of AH (from 5-10 years) A/dd > 100-110 mm.Hg, A/dc > 170-180 mm.Hg, patients were administered central α2-adrenomimetics (clanidine in dose 0.2-0.3 mg) and droperidol (0.1 ml/kg weight) before surgery; diazepam 0.13±0.04 mg/kg, atropine 0.005±0.0005 mg/kg were used for premedication, 3 group 20 - patients with history of AH (more than 10 years) A/Dd > 110-120 mm.Hg, A/Dc > 190-200 mm.Hg. In the intraoperative period, perlinganite 10 mg intravenous drip was administered.). The 2- and 3-groups were given general anaesthesia with a combination of peridural anaesthesia at the level of TVII-VIII (bupivacaine).

Preoperative examination included: anamnesis of cardiovascular diseases; physical examination aimed at detecting signs of circulatory insufficiency; laboratory tests.

Preoperative examination included: anamnesis of cardiovascular diseases; physical examination aimed at detecting signs of circulatory insufficiency; laboratory tests. In the intraoperative period, changes in gas exchange were monitored using capnometry, level of A/D, HR, SaO2. The state of central haemodynamics was evaluated at all main stages of surgical interventions and repeatedly during a day in the postoperative period.

Results of the study and their discussion: Characterising the clinical course of OA in the 1st group, we found out that the signs of complete segmental sensory-motor blockade were formed by the 18th-22nd minute, the duration of the surgical stage of OA was from 40 minutes to 1 hour. When using SMA and SA, signs of complete segmental sensory-motor block developed by the 6th-8th minute from the moment of subarachnoid administration of the estimated dose of local anaesthetic and persisted for 1.5-2 hours. During the whole operation the patients of all 3 groups under study did not react and did not complain. When assessing the initial state of haemodynamics in 65% of the examined patients hypodynamic type of blood circulation with insufficient compensation of the reduced productive parameters of the heart by increasing the heart rate was revealed.

The initial state (before premedication) of haemodynamics in all three studied groups was characterised by tachycardia, increase in SDD, decrease in single and minute cardiac output. The studied parameters in the groups were identical and did not differ significantly from each other. Blood glucose index in all groups ranged from 7.0 to 10.0 mmol/l (Table 1).

After premedication, haemodynamic parameters in all three studied groups normalised: tachycardia was not observed, SDD decreased, single and minute cardiac output increased. Changes in SpO2 and blood glucose parameters were insignificant. Before skin incision against the background of complete segmental block, the classical clinical and functional manifestations of central segmental blockades - HR decreased, SDD decreased - were registered in patients of all three groups, which were significantly more pronounced when using CA. (Table 1).

Table 1. Some hemodynamic parameters at the stages of anaesthesia and surgery

Stages research	Group	ЧСС min	A/D d Mm.Hg.	A/D s MmHg.	SI l/m2/min	SpO_2 %
before premedication	1-я	82,2±2,0	95,5±1,4	140,5±1,6	2,11±0,06	90±1.2
	2-я	88,8±1,8	100,9±1,5	160,9±1,2	2,4±0,09	92±1.3
	3-я	92,5±1,9	110,6±1,3	165,6±1,3	2,45±0,07	90±1.1
At Operating table	1-я	80,7±1,1	88,4±1,3	125,4±1,3	2,28±0,04	96±1.0
	2-я	80,2±1,3	87,6±1,5	130,6±1,5	2,33±0,06	95±1.3
	3-я	82,9±1,2	88,1±1,3	135,1±1,3	2,4±0,08	94±1.3
Before Beginning operation	1-я	72,6±1,2	72,4±1,3	120,4±1,3	2,07±0,02	96±1.0
	2-я	80,1±1,1	78,3±1,5	125,6±1,5	2,24±0,03	96±1.0
	3-я	82,8±1,3	85,6±1,6	130,1±1,3	2,36±0,05	94±1.2
30 minutes after	1-я	72,8±1,3	72,9±2,0	110,4±1,2	1,98±0,02	98±1.2
	2-я	74,6±1,2	76,4±2,0	115,6±1,3	2,2±0,03	97±1.1
	3-я	82,6±1,4	85,6±2,1	122,1±1,4	2,34±0,04	93±1.3
40	1-я	72,4±1,4	70,2±1,3	112,4±1,1	2,0±0,03	96±1.1

Minutes after End operation	2-я 3-я	74,6±1,8 78,8±1,9	75,4±2,0 82,7±1,8	118,6±1,3 125,1±1,2	2,23±0,07 2,35±0,08	98±1.2 95±1.2

Table 1. Some hemodynamic parameters at the stages of anaesthesia and surgery

At the most traumatic stages of the operation, 20-30 minutes after the beginning of the operation, no significant changes in the studied parameters of haemodynamics in all 3 studied groups in relation to the previous stage were registered. The end of the intervention in the patients of the 3 groups under study was accompanied by a tendency to normalisation of the studied hemodynamic parameters. It should be noted that in patients of the 2nd and 3rd groups haemodynamic parameters approached the initial preoperative values. In the 1st group at this stage of the study SDD was 72.4±1.4 mmHg, SI-2.0±0.03 l/m2/min, HR-72.4±1.4 per min. These analyses showed that they were significantly different from those in group 3 patients, in whom SDD, SI and HR by this time were 82.7±1.8 mm.Hg, 2.35±0.08 l/m2/min and 78.8±1.9 per min, respectively.

In group 1, intraoperative and postoperative period, there was a 20-25% increase in A/DD and A/DS from baseline. In groups 2 and 3, A/DD and A/DS decreased by 10-12% in the intraoperative period, and in the postoperative period, A/DD and A/DS decreased by 5-7%. The course of anaesthesia of 2- and 3-group of patients was characterised by more stable hemodynamics. In the immediate postoperative period, episodes of heart rhythm disturbance were noted in patients with hypodynamic type of blood circulation.

The results of the study of glucose parameters revealed a tendency for glucose levels to increase with SMA and OA: from 8.5±0.1 mmol/l to 8.9±0.1 mmol/l and from 8.6±0.2 mmol/l to 9.1±0.1 mmol/l, respectively. Sedation anaesthesia resulted in a significant decrease in glucose from 8.9±0.1 mmol/l to 8.3±0.1 mmol/l. We note after analysis of the results that saddle anaesthesia is the method of choice for inguinal hernia surgeries in patients with diabetes mellitus, as there was a significant decrease in glucose content in this group.

Conclusions

The course of intraoperative and postoperative periods in patients with concomitant AH during surgical interventions depends on the initial state of the circulatory system, the degree of its disorders and the compensatory capabilities of the organism. In the intraoperative period, the use of hypotensive drugs and combined anaesthesia provides a stable decrease of A/D, but it starts to act not immediately and often causes reflex tachycardia. Assessment of the initial state of the circulatory system in patients with AH allows for predicting the course of anaesthesia and the immediate postoperative period.

References

1. Тимошин А.Д., Юрасов А. В., Шестаков А.Л. Хирургическое лечение паховых и послеоперационных грыж брюшной стенки. Москва, Триада –Х, 2003,142 с.
2. Балаболкин М.И., Чернышова Т.Е., Витер В.И. Внезапная сердечная смерть у больных сахарным диабетом (роль кардиальной автономной нейропатии) // Учебно-методическое пособие. М.,2002.88 с.

3. Дедов И.И. Инновационные технологии в лечении и профилактике сахарного диабета и его осложнений. //Сахарный диабет. 2013;(3):4-10.
4. Заяшников С.В., Баутин А.Е., Яковлев А.С., Гурин М.Н., и др. Оценка эффективности регионарных методов при анестезиологическом обеспечении оперативных вмешательств на диабетической стопе // Регионарная анестезия и лечение острой боли, Т.11 2017. № 2.С.90-97.
5. Матлубов М.М., Гойибов С.С. Оптимизация предоперационной подготовки у больных с сахарным диабетом при проктологических операциях. 2020. International scientific review, (LXXV), 66-70.
6. Гойибов, С. С. (2022). ОПТИМИЗАЦИЯ АНЕСТЕЗИИ У БОЛЬНЫХ ПОЖИЛОГО ВОЗРАСТА С САХАРНЫМ ДИАБЕТОМ ПРИ ОПЕРАЦИЯХ ПАХОВЫХ ГРЫЖ. *Проблемы науки*, (5 (73)), 99-103.
7. Матлубов, М. М., & Гойибов, С. С. (2020). ОПТИМИЗАЦИЯ ПРЕДОПЕРАЦИОННОЙ ПОДГОТОВКИ У БОЛЬНЫХ С САХАРНЫМ ДИАБЕТОМ ПРИ ПРОКТОЛОГИЧЕСКИХ ОПЕРАЦИЯХ. *International scientific review*, (LXXV), 66-70.
8. Гойибов, С. С. (2022). УСОВЕРШЕНСТВОВАНИЕ АНЕСТЕЗИИ У ПОЖИЛЫХ БОЛЬНЫХ С САХАРНЫМ ДИАБЕТОМ ПРИ ОПЕРАЦИЯХ МАЛОГО ТАЗА. *Вестник науки и образования*, (10-2 (130)), 65-69.
9. Гойибов, С. С., & Нематуллоев, Т. К. (2023). ДЕТЕРМИНАНТЫ ПЕРИОПЕРАЦИОННЫХ ИСХОДОВ В КОЛОРЕКТАЛЬНОЙ ХИРУРГИИ: РОЛЬ КОМОРБИДНОСТИ И ЗАСТОЙНОЙ СЕРДЕЧНОЙ НЕДОСТАТОЧНОСТИ. *ЖУРНАЛ ГЕПАТО-ГАСТРОЭНТЕРОЛОГИЧЕСКИХ ИССЛЕДОВАНИЙ*, *4*(2).
10. Muratovich, M. M., Arsenevic, S. A., Kamaritdinovna, N. D., Saydullaevich, G. S., & Vitalevna, K. O. (2016). Assessment of functional status cardio-vascular system in pregnant women with obesity. *European science review*, (9-10), 105-108.
11. Бегматов, Ж. А., & Гойибов, С. С. (2023). IMPROVEMENTS AFTER SURGICAL ANESTHESIA IN ELDERLY AND OLD AGE PATIENTS IN THE INTERVENTION OF THE HIP JOINT. *ЖУРНАЛ ГЕПАТО-ГАСТРОЭНТЕРОЛОГИЧЕСКИХ ИССЛЕДОВАНИЙ*, *4*(2).
12. Muratovich, M. M., Arsenevic, S. A., Kamaritdinovna, N. D., Saydullaevich, G. S., & Vitalevna, K. O. (2016). Assessment of functional status cardio-vascular system in pregnant women with obesity. *European science review*, (9-10), 105-108.