

## OPTIMIZATION OF ANESTHESIA IN ELDERLY PATIENTS WITH DIABETES MELLITUS DURING INGUINAL HERNIA OPERATIONS

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### ABSTRACT

*The article reflects the results of a study evaluating the effectiveness of anesthesia in elderly patients with diabetes mellitus who have been subjected to inguinal herniation. 56 patients were examined. All of them were consulted by an endocrinologist in the preoperative period, correction of blood glucose levels was carried out with short-acting insulin. Depending on the method of anesthesia used, the patients were divided into three groups. The tests were carried out in five stages. Analysis of the results showed that the anesthesia performed is the method of choice for inguinal herniation in diabetic patients.*

**KEYWORDS:** *Diabetes Mellitus, Spinal Anesthesia, Saddle Anesthesia, Inguinal Hernia, Old Age*

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### INTRODUCTION

Hernias still remain one of the most common surgical pathologies [1,2]. Thus, according to various authors, inguinal hernias occur in 73.5% of men and in 20.3% of women (1.12), the proportion of gerontological patients with pinched and recurrent hernias is 68% [2,3]. The course of the disease in patients of this group is often complicated by endocrine pathology and most often by type II diabetes mellitus. Thus, the number of patients with inguinal hernias on the background of long-term diabetes mellitus ranges from 12.5% to 17%, [3,4,5] While every second of them needs surgery, because DM is detected in more than 5% of cases as a concomitant pathology [2].

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At the same time, the provision of adequate and safe anesthesia in this category of patients is a serious problem.

A necessary requirement for anesthesia in patients with DM is the requirement of its adequacy, since afferent intraceptive pulsation from the surgical intervention zone leads to a violation of endocrine homeostasis, fluctuations in the level of insulin in the blood. If we assume that the pathophysiological basis of DM is uncompensated neoglucogenesis in combination with inhibition of peripheral glucose utilization, and an increase in the level of catecholamines and adrenal steroids as a result of the formation of a post-aggressive reaction during surgical interventions changes carbohydrate metabolism in the same direction, the danger of serious disorders of this type of metabolism, and primarily severe hyperglycemia, becomes clear [6,7,8]. Consequently, maintaining optimal blood sugar levels during surgery is possible only through adequate protection from the stress of surgical intervention by choosing the right method of anesthesia [9]. Many patients with diabetes require preoperative corrective therapy, requiring improvement of carbohydrate metabolism and normalization of blood sugar. However, this can be easily achieved with planned operations [10,11].

Drug preparation for anesthesia is carried out according to the generally accepted scheme, but taking into account the increased sensitivity of such patients to sedatives. However, anesthesiology does not yet know ideal and universal solutions to the problem of protecting the patient from surgical aggression. The appearance of modern drugs for anesthesia and the improvement of surgical treatment results at the present stage of development of endocrine surgery is seen in the further improvement of preoperative preparation and intraoperative anesthesia. [12]

**Purpose of research:** To evaluate the effectiveness of the anesthetic aid in elderly patients with diabetes with inguinal hernia.

**Materials and methods of research:** 56 patients were examined in the surgical department of the 1st clinic of the Samarkand Medical Institute. All patients (from 62 to 78 years old) had inguinal hernias performed as planned.

All subjects in the preoperative period, after consultation with an endocrinologist, received insulin therapy using short-acting insulin (actrapid) at least 4-6 times / day until the blood glucose level stabilized within 7-10 mmol/l, fasting glycemia 6-8 mmol / L. The average dose is 22.8 IU/day.

Depending on the anesthesia technique used, the patients were divided into three groups; 18 patients were included in group 1, general anesthesia (OA) was performed using intravenous anesthetics consisting of ketamine  $0.67 \pm 0.2$  mg/kg, fentanyl  $0.002 \pm 0.0005$  mg/kg, propofol  $0.18 \pm 0.51$  mg/kg, in premedication included diazepam  $0.13 \pm 0.04$  mg/kg, atropine  $0.005 \pm 0.0005$  mg/kg. The 2nd group included 19 patients, diazepam  $0.13 \pm 0.04$  mg/kg, atropine  $0.005 \pm 0.0005$  mg/kg were used for premedication, spinal anesthesia with 0.5% bupivacaine solution 12.5-15 mg subarachnoid was used as anesthesia. Puncture of the subarachnoid space was performed at the L3-L4 level with Pencan 25 G needles. The 3rd group included 19 patients, premedication was performed with diazepam  $0.13 \pm 0.04$  mg/kg, atropine  $0.005 \pm 0.0005$  mg/kg, saddle anesthesia with 0.5% bupivacaine solution 6-8 mg was used as anesthesia. For saddle spinal anesthesia, puncture of the subarachnoid space was performed at the L3-L4 level in patients in a sitting

position with Pencan 25G needles. After subarachnoid administration of a local anesthetic, patients were in a sitting position for 5-10 minutes before the onset of anesthesia.

The research was carried out at 5 stages: 1-before premedication (initial values), 2 - on the operating table, 3- before the skin incision, 4- 20-30 minutes after the start of the operation, 5 - after the end of the operation.

In all three groups, mean dynamic pressure (SDP), heart rate (HR), hemoglobin oxygen saturation (SpO<sub>2</sub>), Cardiac index (SI) and blood glucose were monitored before and intraoperatively. Hemodynamic parameters were determined using the monitor "Triton" (Russia).

Statistical processing of the results of the study was carried out by multidimensional statistical analysis of data based on application software packages for PC StatisticaforWindows 5.1. The results were considered reliable with an error probability (P) of less than 0.5.

**Results and discussion:** Characterizing the clinical course of OA in group 1, we found that signs of complete segmental sensory-motor blockade formed by the 15th-18th minute, the duration of the surgical stage of OA ranged from 40 minutes to 1 hour. When using SMA and CA, signs of a complete segmental sensory-motor block developed by the 6th-8th minute from the moment of subarachnoid administration of the calculated dose of local anesthetic and persisted for 1.5-2 hours. During the entire operation, the patients of all 3 study groups did not react, they did not complain.

The initial state (before premedication) of hemodynamics in all three study groups was characterized by tachycardia, an increase in ABP, and a decrease in one-time and minute heart performance. The studied parameters in the groups were identical and did not differ significantly from each other. The blood glucose index in all groups ranged from 7.0 to 10.0 mmol/l (Table No. 1).

**TABLE NO. 1. SOME INDICATORS OF HEMODYNAMICS AT THE STAGES OF ANESTHESIA AND SURGERY**

Stage of research	Group	Studied parameters				
		HR, min	ABP, mmHg.	HI, l/m <sup>2</sup> /min	SpO <sub>2</sub> , %	Glucose, mmol/l
Before premedication	1-я	86,2±2,0	92,5±1,4	2,41±0,06	96±1.2	8,6±0,2
	2-я	86,8±1,8	92,9±1,5	2,4±0,09	96±1.3	8,5±0,1
	3-я	87,5±1,9	92,6±1,3	2,45±0,07	95±1.1	8,9±0,1
On operation	1-я	82,7±1,1	88,4±1,3	2,28±0,04	96±1.0	8,6±0,1
	2-я	82,2±1,3	87,6±1,5	2,33±0,06	95±1.3	8,5±0,2
	3-я	82,9±1,2	88,1±1,3	2,4±0,08	94±1.3	8,9±0,1
Before the skin incision	1-я	71,6±1,2	72,4±1,3	2,07±0,02	98±1.1	8,6±0,2
	2-я	75,1±1,1	78,3±1,5	2,24±0,03	96±1.0	8,5±0,2
	3-я	82,8±1,3	85,6±1,6	2,36±0,05	94±1.2	8,9±0,1
20-30 minutes	1-я	72,8±1,3	72,9±2,0	1,98±0,02	98±1.2	8,9±0,2

after the start of the operation	2-я	74,6±1,2	76,4±2,0	2,2±0,03	97±1.1	8,7±0,2
	3-я	82,6±1,4	85,6±2,1	2,34±0,04	93±1.3	8,5±0,1
After the end of the operation	1-я	72,4±1,4	70,2±1,3	2,0±0,03	96±1.1	9,1±0,1
	2-я	74,6±1,8	75,4±2,0	2,23±0,07	98±1.2	8,9±0,1
	3-я	78,8±1,9	82,7±1,8	2,35±0,08	95±1.2	8,3±0,1

After premedication, hemodynamic parameters in all three study groups returned to normal: tachycardia was not observed, ABP decreased, one-time and minute heart performance increased. The changes in  $spO_2$  and blood glucose were insignificant.

Before the skin incision, against the background of a complete segmental block, classic clinical and functional manifestations of central segmental blockades were recorded in patients of all three groups - a decrease in heart rate, a decrease in ABP significantly more pronounced when using CA. Thus, ABP and heart rate in the 1st group of patients decreased by 19.9% and 14.5%, respectively. Against this background, the SI decreased from  $2.39 \pm 0.04$  l/m<sup>2</sup>/min to  $2.07 \pm 0.02$  l/m<sup>2</sup>/min. At the same time, in group 2 patients, the changes in the studied hemodynamic parameters were not so pronounced. ABP and HR decreased only by 11.6% and 9.8%, respectively. SI tended to decrease and amounted to  $2.24 \pm 0.03$  l/m<sup>2</sup>/min. The patients of the 3rd group had minimal hemodynamic changes. ABP and heart rate decreased only by 4.9% and 2.5%. SI was  $2.36 \pm 0.05$  l/m<sup>2</sup>/min, not significantly different from the initial values.

At the most traumatic stages of the operation, 20-30 minutes after the start of the operation, there were no significant changes in the studied hemodynamic parameters in all 3 study groups relative to the previous stage. [13]

The end of the intervention in patients of 3 study groups was accompanied by a desire to normalize the studied parameters of hemodynamics. It should be noted that in patients of the 2nd and 3rd groups, the hemodynamic parameters approached the initial preoperative values. In group 1 at this stage of the study, the ABP was  $70.2 \pm 1.3$  mmHg, SI- $2.0 \pm 0.03$  l/m<sup>2</sup>/min, heart rate- $72.4 \pm 1.4$  per minute. The analysis data showed that they significantly differed from those in the 3rd group of patients in whom ABP, SI and heart rate by this time were respectively  $82.7 \pm 1.8$  mmHg,  $2.35 \pm 0.08$  l/m<sup>2</sup>/min and  $78.8 \pm 1.9$  in min.

The results of the study of glucose indicators revealed a tendency to increase its level when using SMA and OA: from  $8.5 \pm 0.1$  mmol/l to  $8.9 \pm 0.1$  mmol/l and from  $8.6 \pm 0.2$  mmol/l to  $9.1 \pm 0.1$  mmol/l, respectively. Saddle anesthesia resulted in a significant decrease in glucose from  $8.9 \pm 0.1$  mmol/l to  $8.3 \pm 0.1$  mmol/l.

After analyzing the results, we note that saddle anesthesia is the method of choice for inguinal hernia surgeries in patients with diabetes mellitus, since there was a significant decrease in glucose content in this group. [14]

## CONCLUSIONS:

Saddle anesthesia using small doses of local anesthetic is the method of choice for inguinal herniation in elderly patients with DM.

In elderly people with diabetes during surgical interventions, saddle anesthesia has a minimal effect on hemodynamics with a positive effect on blood sugar.

When using SMA and OA in elderly patients with DM, caution is required in carrying out the method since the blood glucose level tends to increase.

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