

# Medicinal Protection in Elderly Patients in Ophthalmous Surgery Practice

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**Annotation:** the relevance of the problem of arterial hypertension (AH) is determined by its high frequency in the population, the impact on health, performance and life expectancy of the population. The purpose of the study. To improve existing methods of preoperative preparation and evaluate the effectiveness sedation and neuroleptanalgesia (NLA) in elderly patients with concomitant hypertension to prevent the risk of cardiovascular complications in ophthalmic surgery. Materials and methods. Clinical observations cover 150 patients aged 60 to 89 years ( $74.7 \pm 0.5$ ) who were treated for surgical treatment for age-related cataracts in the ophthalmology department of the clinic of Samara State Medical University. Results. In all patients with hypertension, target blood pressure values were clinically achieved against the background of selected antihypertensive therapy. Arterial hypertension before surgery in patients of group II indicated a pressor reaction of the cardiovascular system (CVS) in response to psychoemotional irritation and associated short-term fear of surgery. Conclusions. The

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results of the study allow us to state that adequate hypotensive therapy in combination with drugs that reduce mental and emotional stress in the preoperative period, the exclusion of visual contact, psychoemotional stress through sedation and neuroleptanalgesia in waiting rooms allow us to achieve stabilization of the clinical condition of patients, clearly correlating with improvement of hemodynamic parameters.

**Keywords:** cataract, hypertension, sedation, neuroleptanalgesia, central hemodynamics.

**Relevance.** The relevance of the problem of arterial hypertension (AH) is determined by its high frequency in the population, the impact on health, performance and life expectancy of the population [1,4, 6]. Elderly and senile people, as a rule, have a significant number of risk factors for cardiovascular diseases, very often there are lesions of target organs and associated clinical conditions, therefore, most patients with AH in these age categories belong to the high and very high risk groups [2]. It is known that psychoemotional stress before and during surgery creates an additional load on the cardiovascular system and usually causes an increase in blood pressure, an increase in heart rate (HR). Also, patients with AH have a more pronounced and long-term hypertensive reaction to the effects of surgical stress [3, 5]. Another major problem of elderly and senile people is decreased vision due to the development of age-related cataracts. According to leading ophthalmologists, almost all those examined over 70 years of age suffer from age-related cataracts. Patients of ophthalmosurgical departments admitted for surgical treatment for age-related cataracts - elderly and senile individuals - suffer from hypertension in 50-80% of cases. Uncompensated hypertension during cataract extraction is the cause of serious intra- and postoperative complications [2]. The above allows us to classify elderly and senile patients with concomitant hypertension as high-risk patients, which requires an individual approach to each specific clinical situation.

**Material and methods:** Clinical observations cover 150 patients aged 60 to 89 years ( $74.7 \pm 0.5$ ) who were treated for surgical treatment of age-related cataracts in the ophthalmology department of the clinic of the Samara State Medical University. All patients observed by us were prepared for cataract extraction surgery on a planned basis. Depending on the method of anesthesia, all patients were divided into 2 groups. Patients of the I -main group were given 10 mg of afabazole at night and on the day of surgery 0.5%-0.15 mg/kg sibazon ( benzodiazepine ), 0.2 mg/kg diphenhydramine and neuroleptanalgesia (NLA ) droperidol 0.25 %-0.25-0.5 mg/kg, 0.005%-0.005 mg/kg fentanyl , 0.5%-15 ml mydriacyl , 1-2 drops instilled 30 minutes before surgery. The patients were kept in waiting rooms for the full onset of the sedative effect . It should be noted that patients of the I -main group were refused atropine due to its negative impact on the cardiovascular system. Patients of the II control group (n=72) underwent standard premedication in the operating room with atropine 0.1%-1.0 mg, diphenhydramine 1%-0.2 mg/kg, HJIA ( droperidol 0.25%-0.5 mg/kg, fentanyl

0.005%-0.005 mg/kg). All patients of groups I and II underwent retrobulbar anesthesia and akinesia with 2%-2 ml lidocaine solution in the operating room and the operation itself - extracapsular cataract extraction with implantation of an artificial lens.

All patients suffered from concomitant hypertension and had complications of its course: ischemic heart disease, angina of effort II - III functional class according to the Canadian classification - 22 (28.2%), history of myocardial infarction (MI) - 9 (11.5%), 2 of them repeated; complex disturbances of cardiac rhythm and conduction - 14 (17.9%), chronic heart failure - I - III degree according to NYHA - 12 (15.4%). In all the studied patients, cardiovascular disorders were combined.

Indications for ophthalmosurgical operations in elderly and senile patients with concomitant hypertension were: age-related cataract, diabetic cataract, traumatic cataract, swelling cataract. According to the classification According to the initial physical condition, all patients belonged to ASA class II - III .

To evaluate the effectiveness of the preoperative drug preparation options we used, we used generally accepted clinical signs, subjective sensations, as well as data from electrophysiological, functional and biochemical research methods reflecting the functional state of the main life support systems.

For all patients, blood pressure, mean arterial pressure ( MAP ) was calculated using the formula:  $(\text{Systolic BP} + 2 * \text{Diastolic BP}) / 3$ , heart rate (HR), blood oxygen saturation ( Sp O<sub>2</sub>) were measured continuously throughout the operation and postoperative period using the MPR6-03-Triton monitor (Russia).

The research was conducted in 5 stages:

30 minutes before surgery (initial values);

On the operating table;

The most traumatic moment of the operation;

After the operation is completed;

The next day after the operation.

All numerical values obtained during the study were processed by the method of variation statistics using the Student criterion .

**Results:** The diagnosis of hypertension was made on the basis of anamnesis data, complaints, clinical picture of the disease, risk factors, data from clinical, laboratory and instrumental examination methods according to recommendations ESH / ESC (2018).

| Indicator   | BP , mmHg |           | Type of anesthesia |          |
|-------------|-----------|-----------|--------------------|----------|
|             | Systolic  | Diastolic | Group I            | II group |
| AG Degree 1 | 140-159   | 90-99     | 25                 | 19       |
| AG Degree 2 | 160-179   | 100-109   | 38                 | 40       |
| AG Degree 3 | ≥180      | ≥110      | 15                 | 13       |

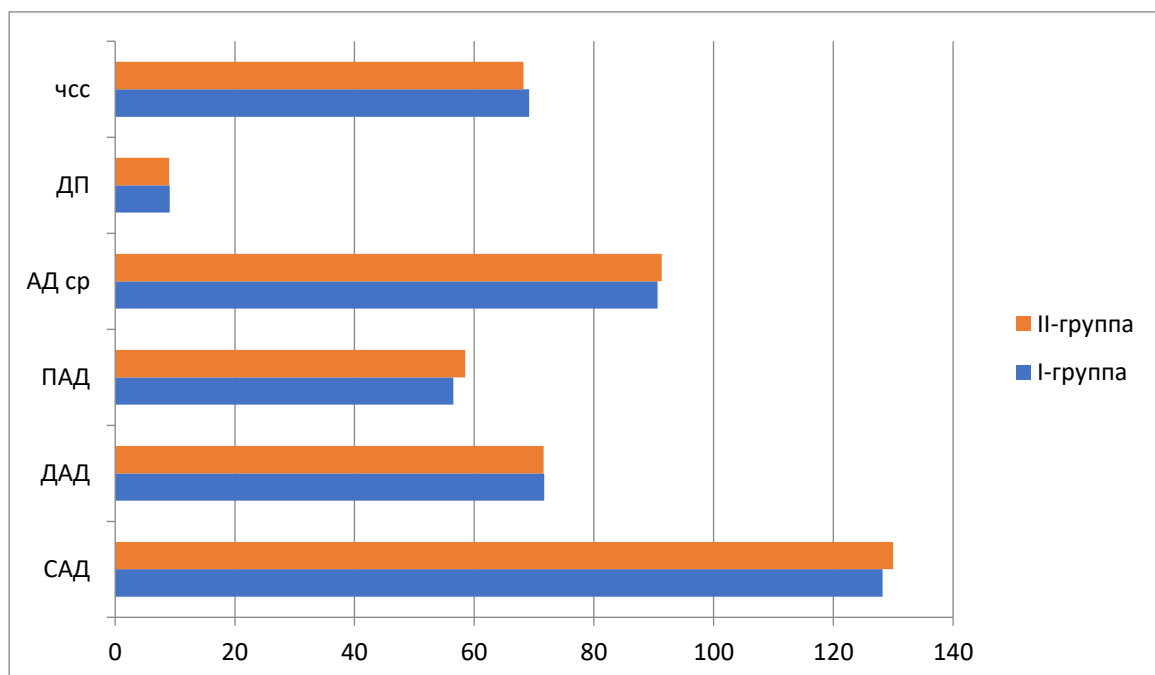
As can be seen from Table 1, the overwhelming majority of patients (n=78) had grade 2 hypertension, which accounted for 52% of the total number of patients (n=150), 44 patients had grade 1 hypertension (29.3%), and only 28 patients had grade 3 hypertension (18.7%).

In all patients with hypertension, target blood pressure values were clinically achieved against the background of selected antihypertensive therapy. The effect of therapy was assessed based on the

results of multiple measurements of clinical blood pressure (according to the method of N.S. Korotkov). To assess the effectiveness of the selected antihypertensive therapy, noninvasive blood pressure monitoring was performed in a hospital setting during preoperative preparation, surgery, and the early postoperative period. The initial blood pressure values in patients with hypertension are presented in Table 2.

**Table 2. Baseline BP values in patients with concomitant hypertension**

| Indicator    | 1st group | P-group  |
|--------------|-----------|----------|
| SBP ( mmHg ) | 128.2±3.2 | 130±2.9  |
| DBP ( mmHg ) | 71.7±1.8  | 71.6±1.8 |
| PAD ( mmHg ) | 56.5±2.0  | 58.5±2.3 |
| BP ( mmHg )  | 90.6±1.8  | 91.3±2.1 |
| DP Index     | 9.1±2.2   | 9.0±2.1  |
| heart rate   | 69.2±2.4  | 68.2±1.4 |



**Fig. 1. Initial blood pressure values in patients with concomitant hypertension**

**Table 3. Comparative analysis of hemodynamic parameters at the stages of anesthesia**

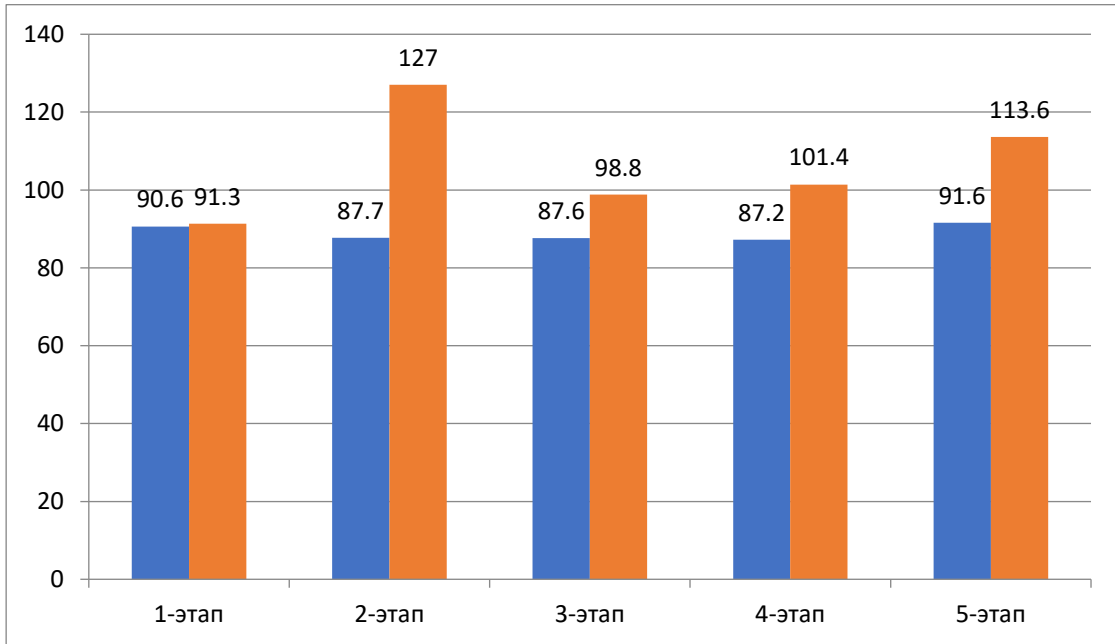
| Groups    | Parameters | Research stages |                    |                                  |                             |                             |
|-----------|------------|-----------------|--------------------|----------------------------------|-----------------------------|-----------------------------|
|           |            | Original        | On operating table | Most traumatic moment operations | An hour after the operation | One day after the operation |
| 1st group | GARD EN    | 128.2±3.2       | 125.4±4.2          | 124.8±5.2                        | 123.4±1.4*                  | 128.8±3.4**                 |
|           | DBP        | 71.7±1.8        | 68.4±3.3           | 69.3±3.1                         | 67.9±2.4*                   | 73.2±1.8**                  |
|           | ADSR       | 90.6±1.8        | 87.7±3.7           | 87.6±4.1                         | 87.2±1.9                    | 91.6±2.6                    |
|           | Heart rate | 69.2±2.4        | 65.2±3.4           | 65.8±3.2                         | 66.5±1.6 !                  | 70.1±2.4                    |
|           | SpO2       | 98.1±0.4        | 98.2±0.5           | 97.9±0.4                         | 98.0±0.7                    | 98.1±0.9                    |
| 2-group   | GARD EN    | 130, 1 ±2.9     | 180.8±4.4***<br>Δ  | 132.3±2.4**<br>Δ                 | 135.4±1.9*<br>Δ             | 150.2±4.6*<br>** Δ          |
|           | DBP        | 71.6±1.8        | 100.0±2.2***       | 82.4±3.6*                        | 85.3±1.7 Δ                  | 95.4±3.3*                   |

|            |          |                          |                          |                         |                           |
|------------|----------|--------------------------|--------------------------|-------------------------|---------------------------|
|            |          | $\Delta$                 | ** $\Delta$              |                         | ** $\Delta$               |
| ADSR       | 91.3±2.1 | 127.0±3.2***<br>$\Delta$ | 98.8±4.5*<br>** $\Delta$ | 101.4 ±2.4*<br>$\Delta$ | 113.6±3.9*<br>** $\Delta$ |
| Heart rate | 68.2±1.4 | 88.4±2.7*<br>** $\Delta$ | 82.0±2.3*<br>** $\Delta$ | 71.4±3.1**              | 78.4±3.2*<br>** $\Delta$  |
| SpO2       | 98.2±0.5 | 97.7±0.4                 | 98.0±0.7                 | 98.1±0.7                | 98.3±0.4                  |

Note:\* - p 1-significance of differences compared to baseline values;

\*\* -p2-in comparison with the previous stage of the study;

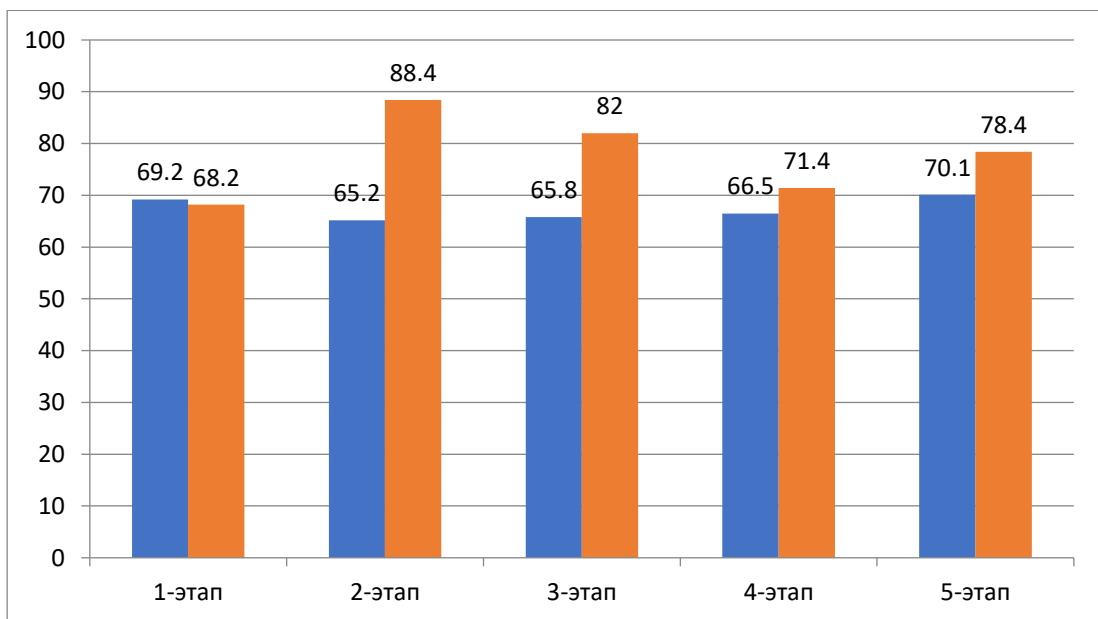
$\Delta$  p3 - in comparison with the control group.



**Fig. 2. BPC values at the stages of research**

Note:\* - p 1-significance of differences compared to baseline values;

$\Delta$  - p2-D in comparison with the previous stage of the study



**Fig. 3. Heart rate indicators at the stages of research.**

Note:\* - p 1-significance of differences compared to baseline values;

$\Delta$  -p2- $\Delta$ in comparison with the previous stages of the study

In a comparative analysis of hemodynamic parameters between the main and control groups, reliable differences in blood pressure and heart rate were observed at almost all stages of the study. The initial values of these parameters after antihypertensive therapy were normalized and were practically the same.

However, in patients of group II, on the operating table, the mean arterial pressure was  $127.0 \pm 3.2$  mm Hg, heart rate  $88.4 \pm 2.0$  beats per minute, after the introduction of HJ 1 A preparations in the intraoperative period, relative hemodynamic stability was maintained, however, the mean arterial pressure remained high  $98.83 \pm 4.5$  mm Hg, HR  $82 \pm 2.3$  beats per minute, which characterized the persistent spasm of peripheral vessels. Arterial hypertension before surgery in patients of group II indicated a pressor reaction of the cardiovascular system (CVS) in response to psychoemotional irritation and the associated short-term fear of surgery. In the postoperative period, the indices of the functional state of the CVS improved, however, tachycardia still persisted (HR  $85.4 \pm 1.4$  beats per minute), relatively high MAP  $101.4 \pm 2.4$  mm Hg, which required additional parenteral use of antihypertensive and analgesic drugs. In patients of group I, MAP stabilized, amounting to  $87.7 \pm 3.7$  mm Hg, heart rate  $66.2 \pm 3.4$  beats per minute at stage I after premedication. Such a positive decrease and stabilization of hemodynamics should be attributed to the influence of antihypertensive drugs in the preoperative period. The introduction of sedatives caused a drowsy state, indifference to the environment. However, all patients in group I were contactable, which made it possible to conduct the necessary studies. During the entire operation, the patients we observed did not present any complaints.

It should be noted that in patients of the control group, during ophthalmic surgery with normal initial blood pressure, a hypertensive reaction developed in 73.3% of cases: systolic blood pressure increased by an average of 32.7% compared to the initial level, diastolic blood pressure by 40.1%, and pulse blood pressure by 63.5%.

### Conclusions:

1. The presence of uncontrolled arterial hypertension in ophthalmic surgical patients undergoing cataract extraction increases the risk of perioperative cardiovascular complications; the main clinical risk factors for hypertension are old or senile age, coronary heart disease, obesity, diabetes mellitus, and atherosclerosis.
2. Noninvasive blood pressure monitoring is indicated in all patients with concomitant hypertension who have at least one clinical risk factor and who are scheduled for cataract extraction with pre-sedation in the waiting room.
3. The most effective methods of administering sedation to patients with concomitant arterial hypertension during ophthalmic surgery are: the beginning of sedation in waiting rooms in order to exclude visual contact, psychoemotional stress, the exclusion of drugs that increase systemic blood pressure (atropine, mesaton), the use of midracil, which has clear advantages over the traditional use of atropine and HJIA.

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