

# Experience in hypertensive crisis arresting

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Globally, including in the Republic of Kazakhstan, the most frequent reason for ambulance call is a hypertensive crisis. Every year, a hypertensive crisis develops in 1–5% of patients with arterial hypertension [1]. According to the WHO (1999) definition: hypertonic (hypertensive) crisis is a sudden increase in BP associated with clinical symptoms and requiring its immediate reduction. Since 2003, JNC VII proposes to interpret a hypertensive crisis as a condition caused by a severe increase in BP associated with the appearance or aggravation of clinical symptoms and requiring an immediate controlled decrease in BP to prevent end-organ damage. The main and obligatory feature of a hypertensive crisis is a sudden rise in BP to individually high values. Intensity of clinical symptoms is closely related to the rate of increase in BP. Thus, at present, a triad is characteristic of a hypertensive crisis: the diagnosis of a hypertensive crisis = the level of BP + rapid increase in BP + clinical symptoms of the crisis [1]. Currently, the diagnosis and treatment of hypertensive crisis is based on recommendations for arterial hypertension (2013 ESH / ESC Guidelines for the management of arterial hypertension) of the European Society of Hypertension, ESH and European Society of Cardiology, ESC, Russian Society of Cardiology according to algorithms for arresting of hypertensive crises (2015), as well as clinical protocols of the Ministry of Health of the Republic of Kazakhstan [2].

The prognosis for patients undergoing a complicated hypertensive crisis: 25–40% of patients die within 3 years due to renal failure or stroke, and 3.2% will develop renal failure requiring hemodialysis. In connection with these, the issue of professional arresting of hypertensive crisis to avoid complications of both the crisis itself and too accelerated treatment is topical.

According to the world-recognized classification, hypertensive crises (HC) are divided into two groups: uncomplicated and complicated. Uncomplicated HC (noncritical, emergency, urgency) – proceeds with minimal subjective and objective symptoms in the settings of existing significant increase in BP. It is not associated with the acute development of end-organ damage. It requires a decrease in BP in a few hours. Emergency hospitalization is not required.

Complicated HC (critical, emergency, life-threatening, emergency) is associated with the development of acute clinically significant and potentially fatal end-organ damage

which requires emergency hospitalization (usually in the intensive care unit) and immediate reduction in BP using parenteral antihypertensive drugs.

The universal first-line drugs for arresting HC, both complicated and uncomplicated, are captopril (as a representative of a short-acting ACE inhibitor at a dose of 25-50 mg) and diuretics (as a representative of hydrochlorothiazide at a dose of 12.5-25 mg).

Clinical effects of captopril due to decreased activity of the Renin-Angiotensin-Aldosterone System include: vasodilatory action, decrease in peripheral vascular resistance, afterload, preload, increases tolerance to load, reduces left ventricular hypertrophy, reduces tonus of efferent renal glomerular arteriole, thereby improving intraglomerular hemodynamics, and prevents the development of diabetic nephropathy. The effect of hyperkalemia that occurs while taking ACE inhibitors is eliminated by the simultaneous administration of hydrochlorothiazide.

**The trial objective was** to study the effectiveness of Captopril N in arresting of hypertensive crises.

**Material and methods.** Trials conducted on the basis of the city cardiological center. 74 patients, aged from 21 to 83 years that seek medical attention were registered with hypertensive crisis. Of them: 40 were female; 34 were male. The examination program included: general and biochemical blood tests (total protein, AST, ALT, bilirubins, urea, creatinine), cholesterol, fasting glucose, coagulogram, fluorography, ECG, echocardiogram, kidney ultrasound, values – systolic and diastolic blood pressure (SBP, DBP) on the arms and legs. The patients were divided into 2 groups: the first included 56 patients with uncomplicated hypertensive crisis, the second group – 18 patients with complicated hypertensive crisis. Oral administration of half or one tablet of Captopril N Viva Farm (50/25), a fixed combination of the ACE inhibitor captopril 50 mg and hydrochlorothiazide 25 mg was suggested to patients for arresting hypertensive crisis.

**Outcomes and discussion.** In 20.4% of patients, HC was induced by adverse emotions, psychic traumas, in 12.0%, physical overstrain in – 29%, mental overstrain – 21% and in 17.6% – patients could not indicate a possible cause of hypertensive crisis. In 34% of patients, hypertensive crisis developed in the presence of acute respiratory disease. In patients with uncomplicated HC, a systolic-diastolic crisis was observed (94.1% of cases), and in patients with complicated HC, a significant increase in DBP was recorded in 96.5% of cases (greater than or equal to 110 mm Hg). In the vast majority of patients with uncomplicated hypertensive crisis, a neurovegetative form of crisis or a water-salt form was observed.

And with complicated hypertensive crisis:

- **cardiopathic syndrome** in the form of arrhythmic syndrome (atrial or ventricular extrasystoles) in 5 patients, ischemic syndrome (transient acute coronary syndrome) in 11 patients.
- **encephalopathic syndrome**, which was observed in the form of increasing intense headache (piercing, breakable, bursting) frequently and more in the frontal and occipital region of head, dizziness, seeing spots, tinnitus, transient reduction in vision in 3 patients, transient focal symptoms in 7 patients.

The rate of reduction in BP in the algorithm for arresting of uncomplicated HC – A gradual decrease in BP over 2-6 hours with subsequent selection of a constant antihypertensive therapy.

The rate of decrease in BP in the algorithm for arresting of complicated HC – rapid decrease in BP over 30–120 minutes by 15–25%. Within 2-6 h, target BP was 160/100 mm Hg with further oral medications for planned hypertension treatment.

For arresting any hypertensive crisis, we used half of Captopril H Viva Farm tablet (50/25), and with systolic blood pressure over 180 mmHg – whole tablet. The drug effect becomes evident after 15-60 minutes. The maximum effect of drugs occurred within 1 hour and corresponded to the basic requirements for urgent treatment of HC. When arresting a hypertensive crisis, one should not seek too significant a decrease in BP over a short period, since this quickly reduces perfusion BP and precipitate occurrence of cerebral, cardiac and renal ischaemia, and also impairs the local mechanisms of circulatory autoregulation) [3].

Reingestion of Captopril H was necessary in 32% of cases. Repeated crises over the next 24 hours were observed in 4% of cases (patients did not take planned antihypertensive drugs). The drug was well tolerated by patients.

Considering our experience with Captopril H, we suggest using it for arresting any HC, especially in patients of older age groups with signs of heart failure or a history of myocardial infarction.

The drug is contraindicated in renal artery stenosis, chronic renal or hepatic failure, pregnancy, lactation, hypersensitivity to the drug and other ACE inhibitors, post-renal transplantation status, aortic stenosis and similar changes that occlude blood outflow.

**Conclusions:** In the arresting of hypertensive crises, a universal drug for arresting HC is Captopril H administration at a dose of 25 mg/12.5 mg or when systolic blood pressure rises above 180 mmHg – 50mg/25mg every 45-60 minutes until BP is normalized with antihypertensive drugs for planned treatment of arterial hypertension.

## **References:**

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