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Detection and Correction of Hypokalemia in Patients with Refractory Chronic Heart Failure

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ABSTRACT

Treatment of heart failure (HF) is important in modern cardiology. One of the chronic heart problems in patients is the circulatory system. Due to the violation of neurohumoral regulation of blood circulation system in patients, the expansion function of peripheral blood vessels changes and the total resistance of peripheral blood vessels increases. Because of this, the ventricles of the heart are forced to increase their tension before contraction and after contraction. According to the conclusions of the World Health Organization, the incidence rate of diseases of the cardiovascular system takes the first place among the general morbidity and mortality rates. In 6-10% of cases, one of the reasons for hospital admission is the irregular intake of powerful diuretics and acute decompensation of CHF with hypokalemia. CHF was detected in more patients. In addition, every year more than 1,000 patients have CHF symptoms. As a result of the decrease in the pumping function of the heart in the body, excessive retention of water in the small and large blood circulation is detected, it has been proven to recommend diuretic drugs to patients with CHF. Causes inadequate blood circulation in the organs and tissues, initially at times of slight physical exertion, and later at rest. Disruption of neurohumoral mechanisms in the pathogenesis of CHF causes salt and water retention in the body. Water retention in the body, which in turn increases the amount of circulating plasma, and as a result, the end diastolic pressure in the left ventricle increases, leads to the development of heart failure [14,15]. In the initial stages of CHF, the main compensatory mechanism is the outflow of water and salts from the body. An increase in the amount of circulating blood leads to an increase in venous blood flow to the heart, which causes a temporary increase in left ventricular stroke volume

Aldosterone causes the body to retain water and sodium. Therefore, these neuro-humorous shifts initially have a compensatory nature, and at the next stages, they become pathological.

Relevance: Hypokalemia is the most common cause of electrolyte imbalance in patients with refractory chronic heart failure, usually as a side effect of diuretics that act on the bladder (furosemide, torside, and uregit).

A decrease in potassium reserves in the tissues leads to a decrease in the contractile function of the ventricular myocardium, a decrease in the glomerular filtration rate and a permanent refractory edema syndrome, a decrease in the left ventricular (LV) stroke volume (LV). Refractory heart failure (HF) that is resistant to diuretics occurs. Timely elimination of hypokalemia reduces the refractoriness of CHF to diuretics.

The purpose of the study: to evaluate the effectiveness of timely administration of potassium preparations in the emergency treatment of refractory heart failure.

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Research material and methods: We examined 36 patients with CHF II b stage (according to NYHA III FC) and CHF III stage (according to NYHA IV FC) and low potassium level, aged 18 to 74 years. The average concentration of potassium in the blood plasma of these patients was 3.1 mmol/l

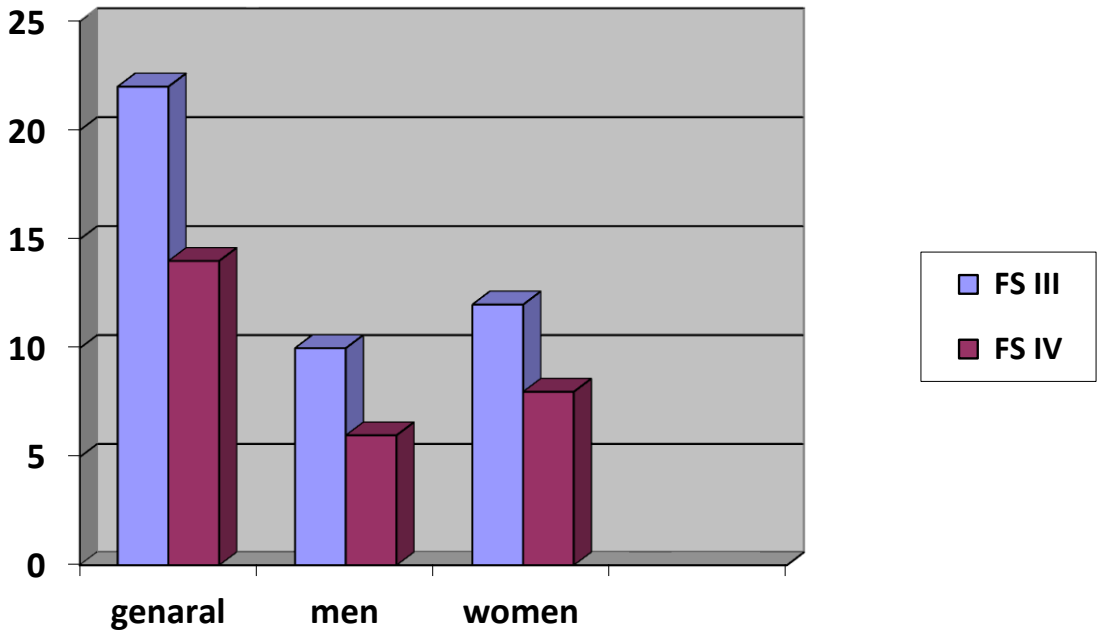
All patients underwent standard clinical examinations such as ECG, ExoKG, potassium concentration in blood plasma was determined, glomerular filtration rate Gold Cocraft formula glomerular filtration rate (KFT)= (140 years) x body weight kg/creatinine µmol/l x 0, 81 was identified. Continuous daily diuresis was measured against the background of the above therapy.

Results of the study: 36 patients with symptoms of refractory CHF participated in the study. Of these, 22 patients (61.1%) had CHF II B stage (NYHA FS III) and 14 patients (38.9%) had CHF III stage (NYHA FS IV).

Table 1. CLASSIFICATION OF PATIENTS INTO STAGES ACCORDING TO VASILENKO-STRAJESCO AND FUNCTIONAL CLASSES ACCORDING TO NYHA

FS (NYHA)	Vasilenko-Strajesko	whole 36	male		female		R
III	II "B" phase	22	10	27,8%	12	33,3%	< 0,001
IV	III phase	14	6	16,67%	8	22,2%	< 0,05

Distribution of patients according to NYHA of CHF between men and women



In all examined patients, the average level of potassium concentration in blood plasma was initially 3.1 mmol/1, and oligoanuria was observed, daily diuresis was 450 ml per day, and left ventricular FV was 36.6%.

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Indicators of ExoKG, daily diuresis, KFT and potassium concentration in plasma in patients with refractory heart failure

Indicators	initially	After 6 days
Left ventricle FV	36,5 ± 0,6	43,6 ± 0,3
KFT	84 ± 0,5	97 ± 0,3
Diuresis	450 ± 0.8	1100 ± 0.6
Potassium in blood plasma	3,1 ± 0,6	3,8 ± 0,95

Discussion: Asparaginate (KMA) 250 ml was administered intravenously every day for 5 days to correct hypokalemia. After KMA infusion, the mean level of potassium concentration in blood plasma increased from 3.1 0.6 mmol 1 to 3.8 0.95 mmol/1. After resolution of symptoms of hypokalemia, there was an average increase in daily diuresis from 450 ml to 1100 ml per day, Edema and wheezing at rest decreased slightly Left ventricular FV from 36.5 0.6% to 43.6 0.3% increased, CFT increased to 97+0.3 ml/min compared to 840.5 ml/min.

Conclusion: Thus, determining the amount of potassium in the blood in CHF and timely administration of KMA 250 ml solution in the case of hypokalemia helps to reduce SYE symptoms and prevent the development of refractory CHF**.**

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