



## Some Biochemical Indicators of Blood Circulation in the Kidneys in Acute Coronary Insufficiency

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**Abstract:** Microcirculation in the liver for obturation and strangulation forms of acute intestinal ileus in conditions if experiment has been studied. Experiments were conducted on mature rats. Multiple areas of vascular degenerative changes as fragment enlargement of their aperture, perivascular in perinusoidal region edema and diapedetic bleeding have been revealed.

**Keywords:** Kidney, abdominal cavities, intraparietal microcirculation.

It should be noted that shift had more dynamic and pronound character for strandulation type jf ALL than for obturation one. intestinal obstruction 1.5-9.4% of all diseases bodies abdominal cavities . According to the results of the analysis of statistical data that determine the state of abdominal surgery for 1993 - 2012. a pattern was established that is characteristic not only for our country, but also for the CIS countries: a steady increase in the number of emergency operations on the abdominal organs, which does not depend on population growth. Suffice it to say that in 2012, compared with 1993, the population growth in the Republic of Uzbekistan was 1.4 times, while the number of operations for intestinal obstruction was 6 times. The initial manifestations of intestinal obstruction are associated with a violation of the passage through the intestines. The main pathogenetic mechanism that determines the transition to the next stage of the pathological process - the breakdown of compensatory mechanisms and access to the organismal level - is a violation of intraparietal microcirculation in a more or less extensive segment of the intestine. The severity of hemodynamic changes determines the degree of change in the functional state of the intestine, water-electrolyte homeostasis, endotoxicosis, dysbacteriosis, general and secretory immunity, intestinal wall trophism with an outcome in necrobiosis.

With intestinal obstruction, hemodynamic and volemic disorders come to the fore, due to a decrease in arterial inflow and a violation of venous outflow due to compression of the vessels of the mesentery (strangulation forms of obstruction) or intramural vessels (all forms of obstruction).

Despite significant advances in the diagnosis and treatment of AIO, many aspects of the mechanism of MHC disorders in various organs, factors and causes of the increase in endotoxemia and their relationship with functional and metabolic changes in cellular structures remain undiscovered. All of the above predetermined the need for this study.

**Purpose of the study:** in the dynamics of experimental acute obstructive and strangulation intestinal obstruction, to study the features of microhemocirculatory (MHC) changes in the kidneys, to establish their relationship with the functional and metabolic parameters of these organs.

## Materials and research methods.

The experiments were carried out on 100 outbred male rats of a mixed population with an initial weight of 180 - 200 g.

MHC of the kidneys by the method of intravital biomicroscopy on a luminescent microscope "LUMAM-IZ" (St. Petersburg, Russia). The model of the obstructive form of acute intestinal obstruction was reproduced by ligation of the small intestine in the middle third, and the strangulation form of acute intestinal obstruction was reproduced by ligation of the intestine along with the adjacent mesentery. The studies were carried out 2, 4, 6, 12, 24 hours after the model was reproduced.

malonic acid was determined in serum and kidney homogenate . dialdehyde (MDA) (Andreeva A.I. et al., 1988), activity of superoxide dismutase (SOD) ( Mkhitarian V.G. and Badalyan G.E., 1979) and catalase ( Korolyuk M.A. et al., 1988 ). The results of the study were processed by the method of variation statistics using a software package.

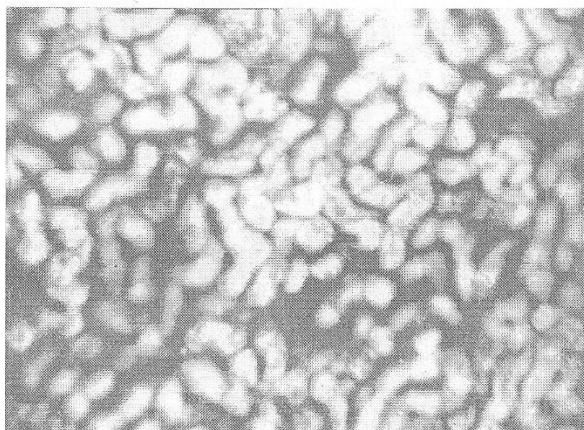
A study of the MHC of the kidneys in the first hours of obturation AIO showed the preservation of the architectonics of the vessels, the structure of the blood flow did not change. After 6 hours, a slight deformation of the contours of the vessels, thickening of the tubular apparatus, apparently due to the exit of the liquid part of the blood into the interstitium , were revealed . The blood flow of functioning vessels was somewhat intermittent due to increased aggregation of blood cells and a decrease in blood flow velocity. Subsequently, the number of functioning capillaries decreased, there was a violation of the contours of the vessels, blood stagnation, small areas of small punctate hemorrhages were detected in the parenchyma, plasma impregnation of the basement membrane of the capillaries and the walls of the proximal convoluted tubules. (Fig. 1).

With strangulation OKN, changes in blood flow in the form of small cellular aggregates in the lumen of capillaries, a decrease in the degree of contrast of the boundaries between vessels and tubules were revealed already after 2 hours. In the future, MHC - violations increased: the deformation of the vascular bed of the cortical layer of the kidney was aggravated, the number of functioning capillaries significantly decreased, the integrity and shape of individual groups of microvessels with precapillary hemorrhages were violated. In the later stages of the experiment, scattered small foci of infiltrates and areas with a loosened homogeneous structure were detected throughout the parenchyma of the organ. The parenchyma around the foci of destruction acquired a darkish hue, plasma impregnation and deformation of the tubular apparatus were found everywhere. (Fig.2).

Regardless of the type of acute intestinal obstruction, a wide range of shifts was observed in the microcirculation of the kidneys with successive and increasing intravascular, vascular and extravascular disorders over time.

The earliest and deepest changes were characteristic of strangulation AIO. The results of biomicroscopy of the liver and kidneys indicated a certain staging of the mechanism for the development of MHC - disorders in the dynamics of AIO.

Against the background of impaired microcirculation, resulting in hypoxia, an intensification of lipid peroxidation in the studied organs was observed, which may be the cause of a violation of the structural integrity of biomembranes . We studied the dynamics of LPO processes (Table 1) and found an increase in the level of MDA in the blood serum in both forms of AIO. With the aggravation of the pathological process and the development of peritoneal phenomena, the degree of hyperlipoperoxidation in the obstructive form increased sharply, exceeding the norm by 187.5%. With strangulation, the changes were more pronounced, they were detected from the first hours of the experiment, and by the end of the experiment, this excess was 346.9%.



**Fig. No. 1.6 hour. Obstructive OKN.**



**Fig. No. 2.6 hour. Strangulation OKN.**

The level of MDA in the homogenate of the kidneys with the obstructive form of OKN began to increase after 4 hours. and by the end of the experiment it exceeded the control by 148.5%; with strangulation - the level of MDA increased already from the first hours and progressively increased.

**The content of MDA in serum (nmol / ml) of experimental animals with OKN**

Research term	Material under study	
	Serum	Kidney homohepatitis
<b>After 2 hours</b>		
- sham operated	5.266±0.632	0.104+ 0.019
- obstructive	5.522 + 0.633	0.106+ 0.016
- different countries	6.355 + 0.763	0.131 ±0.030*
<b>After 4 hours.</b>		
- sham operated	5.466+0.656	0.106±0.200
- obstructive	6.138 + 0.737	0.138+ 0.031*
- strangulation	8.668 + 1.040*	0.154±0.034
<b>After 6 hours.</b>		
- sham operated	5.398+ 0.648	0.130+0.011
- obstructive	9.122+ 0.730*	0.158 + 0.033*
- strangulation	11.120+0.89*	0.220 ±0.044*
<b>After 12 hours.</b>		
- sham operated	5.277+0.422	0.104+ 0.019
- obstructive	9.511±0.761	0.202 ±0.043*
- strangulation	16.300 +1.30	0.266 ±0.057*
<b>After 24 hours.</b>		
- sham operated	5.269±0.422	0.107±0.033
- obstructive	15.150± 1.21*	0.266±0.051
- strangulation	23.55± 1.884*	0.388±0.071

It is known that the processes of free radical oxidation are under the control of the antioxidant defense system, the main ones in which are the enzymes SOD and catalase. Determination of SOD activity in the liver homogenate showed its inhibition in both forms of AIO, depending on the form of obstruction and duration.

In the kidney homogenate, activity after obturation of the animals increased in waves after 2-4 hours, was inhibited after 6, and again gradually rose by the end of the experiment. In the strangulation form of AIO, the activity of the enzyme remained within the control values at the beginning of the experiment, and was inhibited after 6-12 hours. increased at the end of the experiment. Catalase activity increased in both forms.



Thus, in the development of multiple organ failure in AIO, the leading role is played by MHC disorders, the earliest and most pronounced in the strangulation form of intestinal obstruction. Impairment of MHC in the kidneys is progressive. Violations of micromicrocirculation, hemorheology and the degree of endotoxemia determine the severity of the imbalance in the LPO / AOD system. In the kidneys, especially in the strangulation form, the above changes progress.

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