



## To Study the Role of Immune Dysfunction in the Pathogenesis of CVD in Acute Poisoning with CC and its Derivatives throughout all Pathologies Caused by it in Therapy

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**Relevance.** It was determined that in patients with poisoning of the criminal code, in whom the course of the disease is complicated by pneumonia, sepsis, multiple organ failure with a fatal outcome, all signs of CVD and OD are observed, whereas in patients with poisoning of the criminal code and its derivatives, only certain signs of it were observed.

For the first time, the role of changes in the blood content in patients with poisoning of CC and its derivatives of interleukin-6 and interleukin-10, as well as PCT, has been established. According to studies, the actual content of interleukins 6 and 10, respectively, in the blood of patients with poisoning of the criminal code and its derivatives significantly increases, and immediately on the first day after hospitalization, and the intensity of the course of the SVR syndrome becomes more and more acute when observing infectious symptoms such as pneumonia, sepsis, etc.

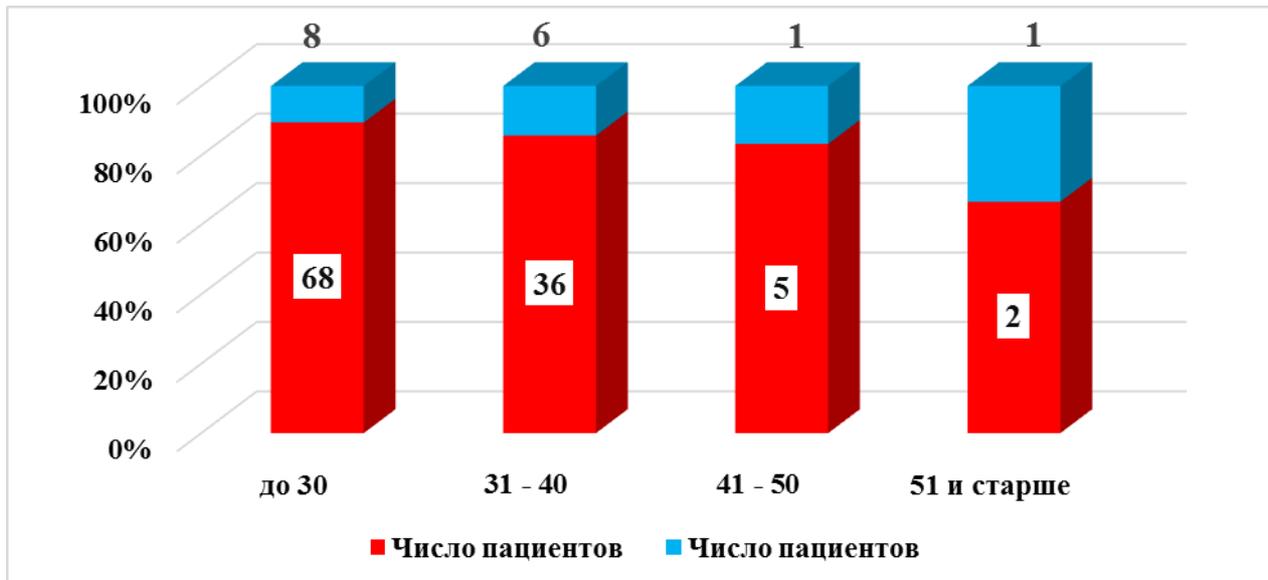
**Purpose of the work:** To determine and characterize the actual relationship between the syndrome of systemic inflammatory reaction (SSR) and functional disorders of immunity in pathological conditions with chemical poisoning of the criminal code and its derivatives.

For the first time, the results of the study show that the high probability of developing infectious symptoms such as pneumonia in patients with acute poisoning of the criminal code on the first day is indicated by the blood concentrations of these interleukins-6 and -10 from 160-162 pg/ml and above and from 65-67 pg/ml and above, respectively. The content of PCT increases ( $P > 0.79$  ng/ml), and D-dimer from 1.48 mcg/ml. Such indicative parameters as interleukin-6 and -10 ( $> 200$  pg/ml and  $> 130$  ng/ml, respectively), PCT ( $P > 1.90$  ng/ml) were attributed to the sensitive and criterion parameters of objective assessment of the risk of death in patients with chemical poisoning of CC and its derivatives. The blood content of patients with poisoning with CC and/or its D-dimer derivative exceeds the value of 2.90-2.95 micrograms/ml.

In total, a sample of 127 patients who were admitted to the Bukhara branch of the RNCMP of Bukhara in the period 2017-2020 with poisoning from the criminal code and/or its derivatives was selected. The patients were taken to the emergency medical center by the medical team of the SMP for emergency indications during the first 4 (1; 4) hours from the moment of poisoning by the CC and its derivatives. Out of 127 patients there were 111 women, 16 men aged 20 to 54 years, the average age of patients was  $(31.2 \pm 10)$  years [1.3.5.7.9.11.13.15.17.19].

A sample of 30 healthy people was also formed, in the age range between 18 and 49 years, whose gender, in percentage ratio, corresponded to the main sample (out of 127 patients with poisoning of the criminal code and its derivatives).

The interval distribution of patients poisoned by CC and/or its derivatives in the conditions of the statistical study described above by age and gender is shown in Figure 1.



**Fig. 1. Distribution of patients with acetic acid poisoning by age and sex**

As can be seen from Figure 1, the vast majority of those poisoned by the Criminal Code and/or its derivatives account for a sample of persons under 40 years of age

The causes of poisoning in 94% of cases were suicide attempts, and in the remaining 6% - criminal motives.

The severity of poisoning was assessed upon admission to the intensive care unit or toxicology department based on the clinical picture of poisoning with CC and/or its derivatives, and symptoms were recorded in parallel: for example, when poisoning with CC and its derivatives, respiratory distress attacks (oxygen saturation <90%), tachycardia (n>100), as well as severe burns from the esophagus and gastric mucosa caused by contact of the MC with the affected area.

Additional manifestations of poisoning of the criminal code were traces of acid burns on the face, hypersalivation and the smell of acetic acid when breathing (in exhaled air).

In cases in which there was a certain risk of death, resorted to the methods of classical resuscitation measures in typical situations (poisoning of the CC and its derivatives), as well as therapy of organs and body systems exposed to the CC or a derivative thereof, namely, a general toilet of the oral cavity, detoxification of the gastrointestinal tract, correction of hemostasis, catheterization of the central veins.

The priority of resuscitation, therapeutic and pharmacological actions was based on the actual condition of the patient in a certain clinical picture.

Measures to provide PMP to those poisoned by the Criminal Code or its derivatives implied the use of narcotic analgesics actions (2% promedolum – 1-2 ml), broad spectrum antispasmodics (2% no-spa-2 ml), 75-100 gr. prednisolone. After that, a thorough washing (sanitation) of the stomach was performed with 4-5.5 liters of clean running water, performed according to the instructions for gastric sanitation in case of poisoning [2.4.6.8.10.12.14.16.18.20]. Further, infusion therapy with various balanced infusion solutions.

In the conditions of inpatient treatment, on the first day after poisoning with CC or its derivatives, poisoned patients received therapy in accordance with the severity of poisoning, in particular, saline solutions in the form of infusions (2-3 hours after poisoning with CC), glucocorticoids, etc., as well as antispasmodics - platyphilin and drotaverine.

The total volume of pharmacological therapy, infusion consumption in the volumetric sense, criteria diagnostic parameters such as venous pressure, chemical composition of urea, hemoglobin level, etc. are determined by the content of bilirubin in plasma.

Starting from the second day after poisoning with CC and / or its derivatives, it is necessary to

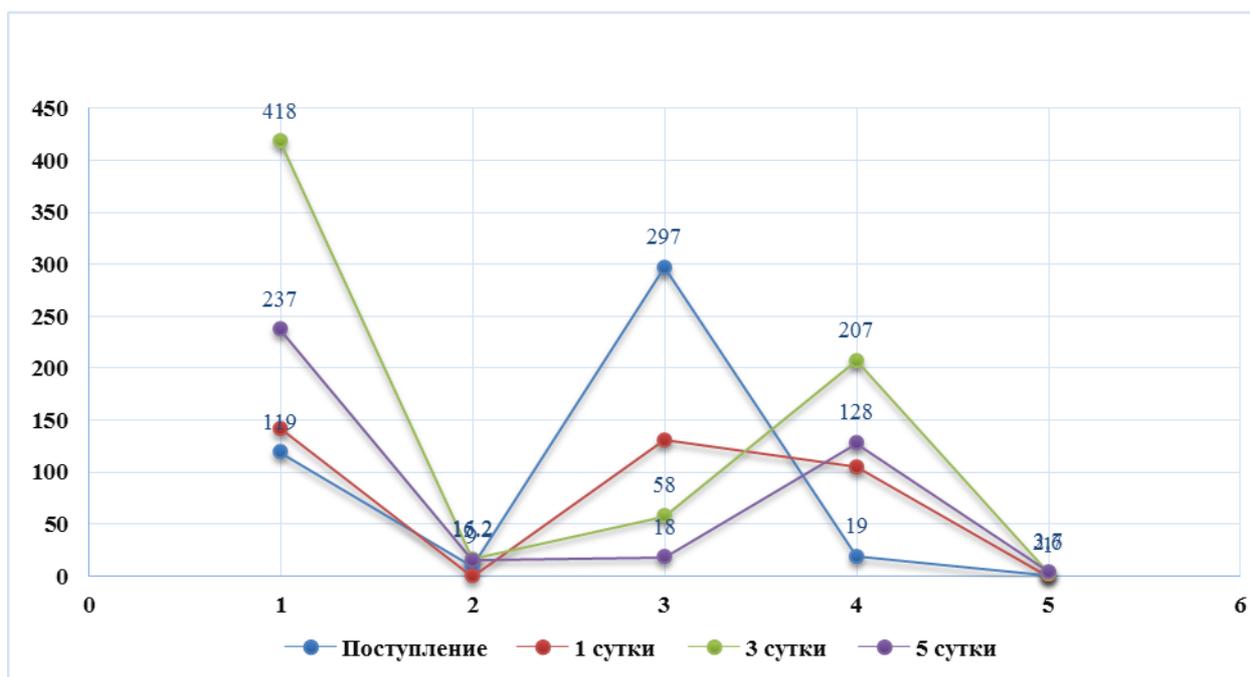
organize drinking and feeding of the poisoned person with products and liquids with the most neutral environment possible. If necessary, a gastrozond is installed for the poisoned person to organize the nutrition of it (for example, if it is impossible to organize the nutrition of it in a natural way due to the presence of inflammatory processes in the esophagus). Patients should be given painkillers according to the prescription of the attending physician.

For the purpose of rapid leaching of acetic acid from the intoxicated organism, the electrolytic composition of the blood should be corrected and hemostasis should be carried out, according to the indicative values of which chemical correction is also performed: the doses of hydrocarbonate are selected according to the established rules. Also, in case of pneumonia, a laboratory analysis of the composition of sputum should be performed, for subsequent analysis of pathogenesis under conditions of external factors, including poisoning with CC and its derivatives.

In order to facilitate the practice and better curation of inflammatory processes, early detection of signs and drawing up a future picture of possible burdens helps. Based on this, we focused on identifying innovative methods of early diagnosis of the CVD process in the first 24 hours after registration in the hospital.

The results were carried out as under standard criteria, the laboratory values of cytokines, the status of the coagulation system and the formation of fibrin were studied. Figure 2. shows the data on the dynamics of CVR indicators in patients with poisoning of the criminal code, complicated by pneumonia and multiple organ failure [21.23.25.26].

It follows from Figure 2 that the criteria indicators recorded in the conditions of poisoning with CC and/or its derivatives were significantly higher in comparison with the indicators of group I patients who recovered without complications.



**Fig. 2 Dynamic indicators of immunological markers of systemic inflammatory response in patients with poisoning of the criminal code, complicated by pneumonia and multiple organ failure (n = 10)**

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Taking into account the fact that in patients of group III – in whom the course of the disease took place with inflammatory complications in the form of pneumonia, sepsis, PON with a fatal outcome, the author recorded parametric indications of D-dimer in the PC of patients poisoned by CC and/or its derivatives, and entered the results thereof in the table below [20.22.24.25.26]. From according to the presented data, it can be noted that in patients with poisoning of the criminal code, we have

identified laboratory signs of progression of the coagulation system towards hypercoagulation, with an increased risk of thrombosis, in patients of group III – in whom the course of the disease took place with inflammatory complications in the form of pneumonia, sepsis, PON with the approach of death.

Based on the data obtained during the study, it was determined that all patients hospitalized with poisoning of the CC and/or its derivatives had the development of clinical volcanoes of the systemic inflammatory reaction syndrome, such as signs of tachycardia, tachypnea, hyperthermia, and in patients of group 3, in whom this pathological process proceeded with the development of such complications as sepsis, PON, pneumonia with fatal outcome, the signs of CVD were increased compared to recovered patients, and this ghost was kept at the level of high values throughout the entire stay in the hospital.

In addition, it was found that the etiology of the development of pneumonia was a combination of an immune deficiency and the attachment of a pathological infection, and in more complex cases, the attachment of bacterial microflora led to the development of complications associated with the development of multiple organ failure, which ultimately increased the risk of death.

It was determined that in patients with acetic acid poisoning, in whom this pathological process proceeded with the development of complications such as sepsis, PON, pneumonia with a fatal outcome, the signs of CVD were increased compared to recovered patients, and this ghost was kept at a high level throughout the hospital stay. Based on the data obtained during the study, it was determined that in all patients hospitalized with acute acetic acid poisoning, their course, outcome and development of complications are based on the development of a systemic inflammatory reaction syndrome.

The highest values of changes in the indicators of laboratory markers that determine the activity of CVD were observed in the first 24 hours after the onset of poisoning, and when conducting a correlation between the development of pneumonia and the indicators of CVD after poisoning with acetic acid, a visible relationship of demonic changes in such indicators as Interleukin-6, Interleukin-10, procalcitonin, C-reactive protein and D-dimer in the blood of patients, namely, the progression of the systemic inflammatory reaction syndrome in the first 24 hours after the onset of poisoning was accompanied by an increase in the concentration of inflammatory mediators such as Interleukin-6 and C-reactive protein, while an increase in the concentration of procalcitonin was determined on the 3rd day of the development of such bacterial complications that are associated with the occurrence of multiple organ failure. In addition, the development of SVR was reflected by an increase in Interleukin-10, which was characterized by the content of active monocytes and the location of mast cells in the perivascular region. In this regard, it was determined that on the first day, the most sensitive and informative in predicting inflammatory complications in patients with UK poisoning are the criteria-indicating parameters of interleukin-6, D-dimer, c-reactive protein and other LC[22.24.26].

Based on the results of the conducted studies, it was found that in patients with acute acetic acid poisoning in the occurrence of pneumonia, an increase in the concentration of such mediators in the first 24 hours as Interleukin-6 above 161 pg/ml, Interleukin-10 above 67 pg/ml, PCT and D-dimer from 0.8 ng/ml and 1.48 mcg/ml, respectively, and the markers of the risk of death in patients of this category were an increase in the concentration of Interleukin-6 above 201 pg/ml, Interleukin-10 above 131 pg/ml, PCT and D-dimer from 1.9 ng/ml and 2.98 mcg/ml, respectively, C-reactive protein up to 29 mg/l and fibrinogen above 5.3 g/l in the first 24 hours of admission to the hospital, and against the background of standard treatment, the concentration of CRP in patients who recovered decreased, and the persistent preservation of CRP indicators against the background of the therapy indicated the ineffectiveness of the treatment and the risk of death. At the same time, we came to the conclusion that CVD was one of the key moments in the pathogenesis of acetic acid poisoning and the occurrence of complications such as pneumonia in the first 24 hours after poisoning, and can also lead to the development of multiple organ failure.

## Conclusions

1. Dynamic indicators of the D-dimer content in blood plasma in patients with fatal CC poisoning showed a 13.7-fold (2.93 (2.65; 3.37) mcg/ml) excess of the D-dimer values in healthy people on the first day, progression and increase in the D-dimer index during the follow-up period by 3 and 5 days of treatment.
2. In patients with fatal poisoning, the number of signs of systemic inflammatory reaction syndrome - 3 (2;4) and organ dysfunction -14 (12;15) has always been higher compared to recovered patients - 2 (0;2) and - 4 (3;4), respectively, and they were also elevated during the entire observation period. Thus, it should be concluded that the precedent of complications and pathological processes caused by poisoning of the criminal Code and/or its derivatives is SSVR.

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