Results.

Table 1

<table>
<thead>
<tr>
<th>Parameters</th>
<th>T activity before treatment</th>
<th>T activity after treatment</th>
<th>AT activity before treatment</th>
<th>AT activity after treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1gr.</td>
<td>2,8±0,1</td>
<td>0,9±0,2*</td>
<td>1,7±0,2</td>
<td>1,0±0,1*</td>
</tr>
<tr>
<td>2gr.</td>
<td>3,0±0,2</td>
<td>2,6±0,2</td>
<td>1,8±0,1</td>
<td>1,6±0,2</td>
</tr>
</tbody>
</table>

*p<0,05 (after treatment)

Conclusion - high therapeutic efficacy of NAC and positive effects on PIS in patients were registered. NAC’s antioxidant and expectorant capacity can improve lung function by decreasing inflammation as well as breaking up mucus.

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MORPHOLOGICAL CHANGES IN ORGANS IN RATS OF EXPERIMENTAL DIABETES MELLITUS TYPE 2

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Diabetes mellitus (DM) is one of the most common diseases with a steady upward trend. According to the statistic evidence of the World Health Organization (WHO) the number of diabetics in the world in 2019 is as high as 463 million [1]. The real incidence is much higher, because most of cases of DM type 2 are undiagnosed. Today, one of the main problems in medicine is deviation of carbohydrate metabolism, which is indirectly provoked by uncontrolled digestion of sugar and sweets. Modern rhythm and lifestyle make it practically impossible to radically restrict the consumption of easily digestible carbohydrates, which further increases the risk of developing DM type 2. Nowadays diabetes is a medical and social problem and a heavy burden to health and society as a whole: 80% of all testing and treatment costs make patients with complications [2]. According to previous studies, this pathology leads to morphological changes, usually in the pancreas, liver, myocardium, kidneys and small intestine. Considering the option of performing an aiming puncture biopsy that is in the arsenal of a modern physician we state it is necessary to investigate the gradual morphological changes in the target organs for timely diagnosis of type 2 diabetes and to conduct appropriate therapy to reduce the damaging effects of hyperglycemia.
The main goal of the research is to study progressive morphological changes in rat’s lung, heart, liver, duodenum and kidneys in experimental DM.

Materials and methods. For the research of DM type 2 morphological changes 50 rats into 2 groups: intact and a group of rats which got dexamethasone in a dose of 0.125 mg / kg body weight (Ref. to Mesova A.M. : A method for reproducing type 2 diabetes mellitus in young rats // (19) KZ (13) AU (11) 22018). During our study, animals have been weighed. On the 7, 14, 21 and 28 days of the study animals of the control and experimental group were slaughtered, their organs were weight and the results of two groups were compared. To perform the pathomorphological research the tissues were put in 10% formalin, the tissues were soaked in spirits, paraffins and were poured in paraffin blocks. After preparation on the cuts on the microtome, they were painted with hematoxylin-eosin, Van-Gieson, Sudan III, and PAS-reaction was provided. The supplies were explored the morphometric complex of Olympus images CORP Model NoE-410DC7: 4VD56547931 with a variable of 40, 100, 200, 400, 800.

Research results. To confirm successful modeling DM type 2 blood glucose level was measures by the blood glucose meter of the Baer Company before the rats were slaughtered. The following data were obtained. Day 1 of the experiment: the average blood glucose level equalled 4.6 mmol / l (which is the main data to confirm the success of DM type 2 modeling). Data changes in blood glucose levels in the course of the development of DM type 2 are shown in the chart and in the table 1.

<table>
<thead>
<tr>
<th>Data changes in blood glucose levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>14</td>
</tr>
<tr>
<td>21</td>
</tr>
<tr>
<td>28</td>
</tr>
</tbody>
</table>

In the group of rats with modeled DM type 2 the next changes were observed: purulent-erosive skin lesions, damage fur, skin thinning, retinal blur and dull sclera. There was a change in behavior related to the damaging effects of dexamethasone on the adrenal gland and decreased secretion, that manifested in the form of euphoria, irritability, hyperkinesia. In the experimental group bradycardia was observed, which eventually changed to tachycardia, and from day 14 returned to bradycardia again. Bradypnoe at the end of the experiment changed to tahypnoy. After weighing organs, there was a decrease in the weight of the liver - 6.5 g (intact - 7.5 g), kidneys - 0.85 g (intact - 0.95 g) and lungs - 1.3 g (intact - 2.0 g), partial increase in the heart mass - 0.9 g (intact - 0.85 g).

At the beginning of the modeling we observed liver changes namely, in the structure of hepatocytes. We observed small- and large-drops fatty infiltration with the formation of one large fat vacuole in separate cells and displacement of the nucleus to the periphery. Sinusoids were expanded. General organ structure has been lost. Thickening and stratification in the vascular wall had been noticed. After that, the changes were being progressing further. In the whole mass of hepatocytes, there was a large and vacuolic non-alcoholic steatosis. On the 21st day of experiment
full blood in the centers of the lobules with thickening and bundle of the vascular wall was observed. On the 28\textsuperscript{th} day focal necrosis of hepatocytes become evident. The PAS reaction confirmed a significant decrease in glycogen. Van-Gieson stain did not show any changes. Sudan III stain confirmed the presence of fat infiltration (Fig 1).

![Liver](image1)

At a microscopic study of the kidneys at the beginning of the expirement a stasis were detected in the arteriolas afferens with fetal blood vessels. In the renal tubules there is a seal, focal destruction of the epithelium with minor phenomena of inflammation. At the 14\textsuperscript{th} day of the experiment protein deposits in the tubules were noticed, marked the epithelium of the tubule dystrophy and the development of focal necrosis with insignificant thickening of the capillary wall. At the 21\textsuperscript{st} day focal development of the changes that can lead to the development of a thyroid-like kidney. Was observed deposition of protein deposits in glomeruli. At the 28\textsuperscript{th} day the development of “thyroid” kidney and organ dystrophy become evident. Edema and dilation of dyelated tubules was observed. Van-Gieson show the hearth of the enlargement of the connective tissue in the vessel wall. Sudan III stain did not show any changes. PAS-reaction is negative (Fig 2).

![Kidney](image2)
At the beginning of the modeling DM we observed heart changes namely dystrophy, focal defragmentation of cardiomyocytes. There is a slight propagation of plasma elements. At the 7th day of experiment: visually, a slight increase in fatty tissue from the side of the visceral pericardium leaf was observed visibly, which can be explained by the increase in the mass of the heart compared with the control group. Microscopically, changes only increased. At the 21st day, dystrophy, lipomatosis, pronounced focal defragmentation of cardiomyocytes become evident. At the 28th day of experiment were growths of adipose tissue on visceral pericardium. In microscopic examination, dystrophy, focal formation of young connective tissue, thinness of cardiomyocytes, partial hypertrophy. There was a significant accumulation of plasma elements in the vessel walls. Van-Gieson showed the process of focal growth of the connective tissue is. Sudan III stain did not show any changes. PAS-reaction is negative (Fig 3).

In the lungs at the beginning of the experiment, spot hemorrhages were found in the interalveolar membranes, eosinophilic masses in the lumen of the alveoli. Detection phenomena of interalveolar membranes, focal emphysematic changes are revealed. Flexfire, dilation of the vascular wall was admitted. At the 14th day of
experiment we saw development emphysema of the lungs, focal destruction of the vessel walls. Pneumonia was noticed, associated with immunosuppressive mechanisms not only dexamethasone, but also diabetes. At the 21st day of experiment, the lung emphysema occurred. We saw extirpation of the epithelium and destruction of the vessel wall in the form of a plasma impregnation. Van-Gieson and Sudan III stain did not show any changes. PAS-reaction is negative (Fig 4).

Fig 4. Lung

During the experiment in rats there was a phenomenon of smoothing of the small intestine, reducing the number of villi and minor inflammation. According to Van-Gieson, Sudan III, PAS-reaction did not show any changes (Fig 5).

Fig 5. Small intestine
Conclusions. According to the results of our experiment, we found that the most significant and total changes in the experimental DM type 2 are in the liver. It is possible to assume that the use of such a method as liver biopsy will provide an opportunity to determine the degree of liver damage at the early stages and, accordingly, to make for patients correction of therapy. But in order to establish a clinically correct diagnosis, one should take into account not only the results of the aiming of the puncture biopsy, but also the history of the patient, since a large group of liver diseases has the same pathological picture, and only the analysis of the results with a complete picture of the history of the disease can provide a coherent picture of the course of the disease, determine the degree of damage and choose the right treatment tactic. In the future, we consider it expedient to study the reversibility of dystrophic changes in the liver when applying different groups of drugs.

References:

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SCIENTIFIC AND APPLIED PROBLEMS OF THE MODERN MEDICO-SOCIAL EXAMINATION IN UKRAINE

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The states around the world are trying to establish an effective rehabilitation system which would provide persons with disabilities the meaningful life and integration / reintegration into society. The problems of the current state of medical and social expertise, both scientific and applied; they are intrinsically linked to the state’s social policy for persons with disabilities. In the sphere of medical and social expertise, one of the aspects is the quality of the provision of medical and social assistance, the rehabilitation measures for persons with disabilities, which reflects the state of the health care system and the nature of state’s social policy.

The beginning of the vocational rehabilitation process is the assignment of the resolution of the medical and social expert commission on professional suitability, which is being included in the rehabilitation individual program of a person with disability. After coming of the persistent disorder of body functions in a person caused by diseases, consequences of injuries or birth defects, that when it interacts with the external environment can lead to a limitation of its life, there is a need to confirm them in the manner prescribed by law. Vocational rehabilitation begins after the formation of an individual rehabilitation program of a person with disability (further - the IRP) and it is an integral part of it [1]. The degree of restriction is measured on a three-level scale and includes the restrictions of I, II and III degrees. This information is about the degree of disability, illness, and limitations or restrictions serves as a basis for formulating the recommendations for rehabilitation measures and their implementation, which also includes the vocational and occupational rehabilitation.