Clinical characteristics, functional and structural changes of pancreas in patients with combination of chronic pancreatitis and chronic bronchitis

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Medical and social importance of chronic pancreatitis (CP) is associated with a high frequency of this disease and possibility of life threatening complications [16, 18], as well as with functional pancreatic insufficiency with the formation of trophologic failure and diabetes in case of prolonged duration [2, 14]. Disease usually develops in patients of working age and leads to temporary and permanent disability. CP more and more frequently is diagnosed in children and adolescents [20].

CP in most cases occurs in conjunction with other internal diseases, including chronic bronchitis (CB). These diseases have common pathogenesis.

One of the main pathogenic mechanisms of CP and CB is hypoxia due to pulmonary failure (impairment of pulmonary ventilation) [8]. General mechanisms that contribute to recurrence, exacerbation, remission of CP and CB are not understood in clinical and in pathogenic terms [10]. Literature highlights several general biological mechanisms. These include "stress anti-stress", "oxidants-antioxidants" [9].

Imbalance in enzymes-antienzymes system (extreme aggression of the first and insufficiency of the second) promotes necrosis of structures of bronchopulmonary system and pancreas. However, in addition to inflammatory processes in pancreas lungs elastic recoil impairs and then (even with clinical remission) affects the contractile function of smooth muscle of airways, promotes the growth of fibrous tissue in both organs, and in small bronchi determines deformation and obliteration. Possibility of changes in the lungs with marked increase of trypsin, elastase, and phospholipase A activity should be taken into account [12].

During CP exacerbation general inflammatory reaction promotes the release of

histamine from mast cells that eventually leads to the development of "local hyperemia reaction" through a cascade of biochemical reactions. It manifests by capillaries dilation and increase of their permeability. Released chemotactic factors (neutrophilic and eosinofilic) cause release of relevant elements of blood from capillaries and their infiltration of reaction zone, and platelet activating factor causes hypercoagulation and progression of inflammation, triggers release of platelet clotting factors and serotonin. These processes contribute to the formation of vascular complications of CP including thrombosis [19]. Perhaps chronic inflammation in the same way is activated in organs of bronchopulmonary system (including chronic obstructive pulmonary disease) [11].

Study objective — analyze of clinical picture of biliary and alcoholic CP associated with CB.

Materials and methods. We observed 128 patients with CP in acute stage against nonobstructive (simple) CB at the stage of non-acute exacerbation.

Majority of studied patients included patients with biliary CP, mostly women — 72 (56.2%), while men were 56 (43.8%). Indeed, patients with biliary etiology of CP (75 patients) included 63 women and 12 men, representing respectively 84.0% and 16.0% of all cases of biliary CP, respectively. Patients with alcoholic etiology of pancreatitis (53 patients) included 44 (83.0%) men and 9 (17.0%) women.

Age of patients was from 32 to 68 years. Age of CP ranged from 3 to 17 years, and chronic bronchitis — from 2 to 18 years.

All patients have their complaints and anamnesis analyzed and had objective, laboratory and instrumental examinations.

Severity of complaints and tenderness on palpation were assessed before and after treatment using medium severity rate (MSR) [6, 7].

Activity of α-amylase in blood and urine, pancreatic izoamilase (P-izoamilase) in blood and urine, lipase in blood, debits of uroamilase — D1 (basal), D2 (30 minutes after standard breakfast), D3 (60 minutes after the same breakfast), rates of induction of endogenous pancreozymin — K1 (30 minutes after standard breakfast) and K2 (60 minutes after same breakfast) were studied to assess the phenomenon of

enzymes blood "deviation" and the state of pancreatic exocrine function.

In addition, fecal pancreatic elastase-1 levels were studied on enzyme-linked immunosorbent analyzer Sanofi (France) using Schebo (Germany) kits [15].

Direct intubation was used to assess pancreatic exocrine function and determine the types of pancreatic secretion. Aminophylline-calcium test was used with special channel gastro tube [3]. Basal and 4 stimulated pancreatic secretion portions were obtained. Volume of duodenal content, debit hour of α-amylase, P-izoamilase, lipase, trypsin, and bicarbonate were assessed. Three days before the study enzyme preparations and antisecretory agents were cancelled. This study was conducted after treatment in 98 (76.6%) patients, as its performance at altitude of pancreatitis exacerbation could trigger increased pain severity and phenomenon of enzymes blood "deviation".

All biochemical studies were performed on analyzer Vitalab Flexor-2000 (Netherlands). The activity of α-amylase, P-isoamilase was studied in blood, urine and duodenal content on the same analyzer using Lachema (Czech Republic) kits. Activity of lipase in blood and duodenal content was measured on the same analyzer using Sentinell (Italy) kits.

Debit-hour of bicarbonate and trypsin in duodenal content was evaluated by manual methods. Bicarbonate levels were determined by reverse titration, and trypsin levels — by Gross method [1].

Pancreatic endocrine function before and after treatment was evaluated by determining glucose and immunoreactive insulin in blood which was studied using "IBOH" (Belarus) kits on gamma pulse counter "Gamma-800" (Medaparatura, Ukraine) [4].

Sonography was performed using device ALOKA SSD-630 (Japan). Size and parts of pancreas (head, body, and tail), precision of its contours, homogeneity of structure, echogenicity, Wirsung duct diameter, presence of pseudocysts and calcifications were assessed. Besides, ultrasound histography of pancreatic head was performed with evaluation of L index, index of homogeneity (N), histographic K_{gst} index [5].

Quality of life was assesses using SF-36 questionnaire and taking into account the features of this scale in CP [17].

Control group consisted of 30 healthy individuals, including 12 (40.0%) men and 18 (60.0%) women, whose ages ranged from 30 to 65 years. That is, the distribution of practically healthy subjects by sex and age was consistent with this distribution in patients.

Statistical analysis of the data was performed on a computer IBM PC Pentium III using standard software packages Microsoft Excel. We calculated average value (M) and its error (m). Data reliability was assessed using Student t criteria which, taking into account the probability (p) was not less than 95%. Cluster analysis was used to identify homogeneous groups by certain parameters [7].

Results. Patients had complains specific to CP at acute stage. The main complaint in all cases was abdominal pain. It should be noted that in patients with biliary CP MSR of abdominal pain was higher than in patients with alcoholic CP. Thus, biliary CP pain was intense in 40 (53.4%) patients, moderate — 28 (37.3%) patients, minimal — 7 (9.3%) patients. MSR of abdominal pain in biliary CP was 2.44. In patients with alcoholic CP intense abdominal pain occurred in 22 (41.5%) patients, moderate — 20 (37.7%) patients, minimal — 11 (20.8%) patients. MSR of abdominal pain with alcohol CP was 2.21.

Localization of abdominal pain also was depended on the etiology of CP. For example, patients with biliary CP often complained of epigastric pain and both hypochondria — in 37 (49.4%) patients; pain in the epigastric region and right hypochondrium was observed in 28 (37.3%) patients, pain in the left hypochondrium and epigastrium — in 10 (13.3%) patients. In alcoholic CP patients often complaint of pain only in the left hypochondrium — 24 (45.3%) patients, less often pain was localized in the left hypochondrium and epigastrium — 20 (37.7%) patients, and epigastrium and both hypochondrium — 9 (17.0%) patients.

Depending on the CP etiology frequency of abdominal pain irradiation varied. 32 (42.7%) patients with biliary CP noted pain irradiation by type of complete belt ($p< 0,05$ compared with patients with alcoholic CP), 21 (28.0%) patients — right half

belt, 15 (20.0%) patients — left half belt ($p < 0.05$ compared with patients with alcoholic CP). 16 (21.3%) patients complained of pain irradiation to the right and upwards ($p < 0.05$ compared with patients with alcoholic CP), 8 (10.7%) patients — precordial area, 6 (8.0%) patients — left shoulder, area under left shoulder, left half of the neck. Patients with alcoholic CP 22 (41.5%) complained of pain irradiation by type of left half belt, 14 (26.4%) patients — complete belt, 11 (20.8%) patients — right half belt, 6 (11 3%) patients — to precordial area, 3 (5.7%) patients — to left shoulder and area under the left shoulder and left half of the neck, 3 (5.7%) patients — to the right and upwards.

Patients reported that pain intensified in 20-30 minutes after meals, especially after taking fatty, fried, spicy food. In addition, 38 (29.7%) patients reported pain intensification after taking baked food, 32 (25.0%) patients — sweet. In all cases pain intensified after taking even small doses of alcohol.

Analyzing the frequency of dyspepsia it was found that patients with biliary CP often complained of bitterness in the mouth — 42 (56.0%) patients, nausea — 38 (50.7% patients, eaten food eructation — 37 (49.3%) patients, heartburn — 23 (30.7%) patients. Patients with alcoholic CP often complained of nausea — 23 (43.4%) patients, heartburn — 18 (34.0%) patients, eaten food eructation — 17 (32.1%) patients, and bitterness in the mouth — 12 (22.6%) patients.

Patients with alcoholic CP had bowel evacuation problems, mainly its loosening — 37 (69.8%) patients. Patients with biliary CP had unstable stool (alternating diarrhea and constipation) — 38 (50.7%) patients. MSR of dyspepsia for CP was 1.82, for alcoholic CP — 1.76.

Patients also had clinical signs associated with pancreatic exocrine insufficiency: weight loss, symptoms of vitamin deficiencies, and more rarely — macroscopically visible undigested food in stool — lienterrhea. MSR of these manifestations was higher for alcohol CP — 1.48 compared with biliary CP — 1.21.

12 patients with alcoholic CP (22.6%) were diagnosed with pancreatogenic diabetes with MSR of clinical manifestations 1.38. Patients with biliary CP developed pancreatogenic diabetes only in 7 (9.3%) cases, and MSR was 0.92.

All patients reported fatigue but mostly it was expressed in alcoholic CP (MSR — 1.52). Asthenic syndrome was less pronounced for biliary CP (MSR — 1.22).

The main manifestation of chronic bronchitis in all examined patients was cough. 25 (19.5%) patients had dry cough, 103 (80.5%) patients had cough with mucous or mucous-purulent sputum. Given that the CB in our patients was nonobstructive and at non-acute stage, signs of bronchial obstruction were absent neither clinically nor by respiratory function study. In case of subfebrile fever (18 patients — 14.1%) it was not due to exacerbation of chronic bronchitis but due to acute exacerbation of CP, as in all cases clinical signs of pancreatitis were dominated over chronic bronchitis manifestations. MSR of complaints associated with chronic bronchitis for alcohol CP was 1.29, and for biliary CP — 1.21.

History included alcohol abuse in all patients with alcoholic CP (during the study or in the past). Acute pancreatitis in history occurred in 32 (25.0%) patients.

Anamnesis concerning CB included seasonality of exacerbations (usually spring and autumn) which occurred in 78 (60.9%) patients. For all patients exacerbation of chronic bronchitis was usually associated with hypothermia which often developed under conditions of high humidity and rainy weather. 98 (76.6%) patients smoked.

During objective study status of all patients was relatively satisfactory. Nine (7.0%) patients had moderate paleness of the skin and mucous membranes. Tuzhylin symptom was positive in 11 (8.6%) patients, Hyulzov symptom — 10 (7.8%) patients, Mussy's symptom on the left side — in 8 (6.3%) patients, Fox symptom — 3 (2.3%) patients, Cullen symptom — in 1 (0.8%) patient.

The tongue was covered with whitish, yellowish or grayish bloom in 89 (69.5%) patients; it has teeth imprints on the edges in 82 (64, 1%) patients. Peripheral lymphatic nodes were not enlarged in any cases.

Percussion over lungs was determined clear lung sounds, lung boundaries were within norm. Auscultation in all patients revealed dry wheezing — single or scattered in small quantities. Percussion and auscultation of heart did not reveal changes associated with pulmonary heart lesion.

Superficial palpation revealed pain in the projection of pancreas in 11 (8.6%) patients, while deep palpation — in all patients. In alcoholic CP pain was more common in the projection of whole pancreas — in 32 (60.4%) patients, and in Gubergrits-Skulsky zone — in 21 (39.6%) patients. For patients with biliary CP pain in the Chauffard zone was more typical and was detected in 43 (57.3%) patients. Pain in the projection of the entire pancreas in biliary CP was determined in 32 (42.7%) patients.

Enlarged liver at palpation by no more than 2 cm below the costal arch occurred in 64 (50.0%) patients, and in all cases palpation signs of liver cirrhosis were absent as such patients we not included in the study. According to this any cases of splenomegaly, free fluid in the abdomen were not observed.

In addition, examined patients had complaints and objective data specific to comorbidities.

Complete blood counts revealed mild anemia in 9 (7.0 %) patients. Urinalysis in 8 (6.3%) patients with concomitant urolithiasis detected typical for this condition changes (slight proteinuria, leukocyturia and microhematuria). General sputum analysis in all cases revealed white blood cells, but no more than 20-25 per visual field (in case of dry cough sputum for analysis was sampled using saline inhalation).

Stool analysis revealed steatorrhea in 10 (18.9%) patients with alcohol and in 5 (6.7%) patients with biliary CP, creatorrhea in 8 (15.1%) and 5 (6.7%) patients and amylorrhea — in 4 (7.5%) and 3 (4.0 %) patients, respectively.

Results of other tube-free method of pancreas exocrine function assessment and the degree of enzymes "deviations" in the blood are presented in Table 1. Activity of α-amylase in blood before treatment was increased in 16 (30.2%) patients with alcoholic CP and in 8 (10.7%) patients with biliary CP. Thereby for alcohol CP α-amylase levels were significantly elevated compared with controls, while for biliary CP only insignificant tendency to increase was observed. A similar pattern was observed in terms of α-amylase urine, P-izoamilase in blood and urine, lipase in blood levels (Table. 1).

For patients with alcoholic CP uroamilase basal production rate was

significantly increased, whereas for biliary CP it remained within normal limits. After receiving a standard breakfast patients with alcoholic CP D2 and D3 were significantly increased and, average value D2 was higher than D3. These patients had increased K1 and K2, but the ratio between them was correct: K1> K2 (Table. 1). Thus, in patients with alcoholic CP indirect data do not indicate difficulties of pancreatic juice outflow. In patients with biliary CP significant increase of D2 was observed, but 60 minutes after food stimulation, we found a significant increase of D3 compared to control (Table. 1). Accordingly K1 did no different from the norm, and K2 was significantly increased. Thus, patients with biliary CP had impaired D3> D2 and K2> K1 ratios what indirectly indicates the difficulty of pancreatic secretion outflow [13].

Study of fecal pancreatic elastase-1 revealed normal values in 5 (9.4%) patients with alcoholic CP and 26 (34.7%) patients with biliary CP. Thus, the reduction of pancreatic external secretion occurred more often in alcoholic CP. Under this disease variant mild pancreatic insufficiency (elastase-1 — 150-200 mg/d) was found in 9 (17.0%) patients, moderate pancreatic insufficiency (elastase-1 — 100-150 mg/d) — 29 (54.7%) patients, severe pancreatic insufficiency (elastase-1 — below 100 mg/d) — 10 (18.9%) patients. In patients with biliary CP mild pancreatic insufficiency was determined in 26 (34.7%) patients, moderate pancreatic insufficiency — in 18 (24.0%) patients, severe pancreatic insufficiency — in 5 (6.7%) patients. Thus, reduced external secretion in alcohol CP was more significant compared with biliary CP.

Basal external secretion values after pancreatic external function tube test was not significantly differ from that of the control group. Important information was obtained after stimulated pancreatic secretion test (Table. 2). Patients with biliary CP had significant reduction of duodenal contents volume and trypsin debit hour after administration of stimulants, while bicarbonate debit hour, α-amylase and lipase levels had only insignificant downward trend. In patients with alcoholic CP duodenal content and volume flow rate of bicarbonate-hour after administration of stimulants of pancreatic secretion were significantly reduced, and lipase and trypsin debit hours

were significantly reduced (Table. 2). These data reflect a more pronounced pancreatic enzyme insufficiency in patients with alcoholic CP according to fecal Analysis of pancreatic external secretion type revealed the following data:

In patients with biliary CP the most common type was lower obstructive pancreatic type — in 36 (48.0 %) patients. Such high frequency of this type of secretion corresponds to imbalance D3> D2 and K2> K1 ratios and reflects the difficulty of pancreatic secretion outflow mainly at Wirsung duct level, likely due papilostenosis which is typical for biliary pathology [13].

Upper obstructive type of pancreatic secretion was revealed more rarely — in 25 (33.3%) patients with biliary CP. Hyposecretory type of pancreatic secretion occurred only in 5 (6.7%) patients with biliary CP. Four (5.3%) patients had hypersecretory type of pancreatic external secretion, and 5 (6.7%) patients had normal type (Fig. 3.6). Thus, severe pancreatic exocrine function decrease in biliary CP is not typical.

Hyposecretory type of pancreatic secretion was more common for alcoholic CP more than for biliary CP and was determined — in 16 (30.2%) patients. That is, almost one fifth of patients with alcohol-induced pancreatitis had marked reduction of pancreatic external secretion what corresponds to decreased trypsin and lipase debit hours and high frequency of pronounced decrease of fecal elastase-1 level. Normal type of pancreatic secretion in alcoholic CP was found only in 3 (5.7%) patients, hypersecretory type — in 2 (3.8%) patients. Frequency of upper obstructive type of pancreatic external secretion is 16 (30.2%) patients, lower — 16 (30.2%) patients (Fig. 3.6).

Regarding endocrine function of pancreas average glucose and immunoreactive insulin blood levels did not significantly differ from that of healthy subjects and were respectively 5.50 ± 0.08 mmol/l and 95 ± 13 mkod/ml.

Particular importance to the results of pancreas sonography was given to diagnosis and assessment of CP severity. Enlargement of whole pancreas or its part often was present in biliary CP — 32 (42.7%) patients, whereas for alcoholic CP this feature was present in 18 (34.0%) patients. Heterogeneity of pancreatic structure was

present with about equal frequency in both forms of CP — 49 (92.5%) patients with alcoholic CP and 69 (92.0%) patients with biliary CP. Reduced tissue echogenicity of pancreas was present in 26 (34.7%) patients with biliary CP and in 13 (24.5%) patients with alcoholic CP. Increased pancreatic tissue echogenicity was observed in 27 (50.9%) patients with alcoholic CP and in 24 (32.0%) patients with biliary CP. Unclear contours of pancreas were detected in 27 (50.9%) patients with alcoholic CP and 35 (46.7%) patients with biliary CP. Dilation of Wirsung duct was found in 28 (37.3%) patients with biliary CP and in 9 (17.0%) patients with alcoholic CP. Pancreatic calcifications occurred in 26 (49.1%) patients with alcoholic CP and only in 6 (8.0%) patients with biliary CP. Pseudocysts of pancreas also occurred more often in alcoholic CP — 11 (20.8%) patients, whereas in the biliary CP they were present in 8 (10.7%) patients. That is, enlargement of whole pancreas or its part as well as reduced parenchyma echogenicity with dilated Wirsung duct are more common for biliary CP than for alcoholic CP. Increase pancreatic tissue echogenicity and presence of pseudocyst and calcifications are more common for alcoholic CP than for biliary CP.

These findings correlate with the types of pancreatic secretion obtained during tube study of patients with CP of different etiology against chronic bronchitis. Thus, in patients with biliary CP dilated Wirsung duct in the one third of cases was consistent with high frequency of lower obstructive secretion type, and more frequent increased echogenicity of pancreatic tissue in alcoholic CP correlated with high frequency of hypersecreation type for this etiological disease variant.

More pronounced increase of pancreatic echogenicity in patients with alcoholic CP was quantitatively expressed in increase of L parameter of ultrasonic histogram. Thus, in these patients L was 195.8 ± 1.6, and in patients with biliary CP — 1863 ± 1.3. L parameter in both groups was significantly higher than in healthy ($p < 0.05$), but L parameter in alcoholic CP was significantly higher than in biliary CP ($p < 0.05$). N parameter was significantly reduced in both variants of CP — in alcohol CP to 7.45 ±0.21%, while in biliary CP to 8.14 ± 0.17%. Both values were lower than in healthy subjects ($p < 0.05$), but did not differ significantly between each other ($p >$

0.05). K_{gst} was very decreased in patients of both groups compared to the normal value ($p < 0,05$) — in patients with alcoholic CP to 68.1 ± 8.7, in patients with biliary CP to 96.3 ± 9.5. K_{gst} in patients with alcoholic CP was significantly lower than in patients with biliary CP ($p < 0.05$) what once again confirms the greater severity of alcohol CP. All patients with biliary CP had sonographic features of certain biliary pathology.

31 (24.2%) patients underwent fibrotracheobronchoscopy. 15 (48.4%) patients were diagnosed with endobronchitis of I degree and 16 (51.6%) — with endobronchitis of II degree. Study of bronchial washings revealed leukocytes to ½ of field of vision. And segmented neutrophils accounted for no more than 35-40% of leukocytes. In 18 (58.1%) patients washings revealed columnar epithelium cell with hyperplasia, 11 (35.5%) — areas of unstructured masses, 15 (48.4%) — squamous cells, 30 (96.8 %) — mucus and 22 (71.0%) — alveolar macrophages. Pulmonary function test did not reveal pulmonary insufficiency in examined patients.

Patients with combined pathology at admission to the clinic had significantly reduced parameters related to physical health characteristics. The most decreased parameter was pain. In patients with biliary CP it was 66.3 ± 1.2 points (healthy — 72.3 ± 2.5 points; $p <0.05$). In patients with alcoholic CP pain index was 32.7 ± 1.4, substantially lower than in healthy subjects and patients with biliary CP ($p <0.05$). Also general health status was also significantly reduced. In patients with alcoholic CP this parameter was reduced to 37.2 ± 1.6 points, with biliary CP — 63.7 ± 1.4, while in the control group — 71.4 ± 1.5 points ($p <0.05$ between two groups of patients and between patients and healthy subject). Index of physical function in patients was reduced to 31.4 ± 2.7 points, and index of role physical functioning was reduced to 36.8 ± 1.3 points, while in healthy subject there values were 78.3 ± 1.7 points and 71.4 ± 1.8 points respectively (in both cases $p <0.05$).

The most reduced parameter of mental health was viability parameter. In patients with combined diseases it was about 31.9 ± 1.7 points, and in the control group — 72.3 ± 2.2 points ($p <0.05$). Indeed, our patients had asthenia, cancerophobia, emotional lability, hypochondria, depression, which probably also

affected the viability parameter and other mental health parameters by SF-36 scale. However, study of psychosomatic disorders was not our task. Assumption expressed above is also confirmed by reduced mental health index which in examined patients was 34.6 ± 1.8 points (in the control group — 77.8 ± 2.3 points; $p < 0.5$). Parameters of social functioning and emotional role functioning were also reduced to 40.2 ± 1.1 points and to 42.7 ± 1.3 points, respectively (in the control group — 74.8 ± 1.6 points and 71.3 ± 0.9 points, respectively; $p < 0.05$).

Thus, patients with CP in combination with chronic bronchitis had significantly reduced quality of life parameters which describe physical and mental health. Moreover, in patients with biliary CP pain value was significantly lower than in patient with alcoholic CP and vice versa, in patients with alcoholic CP general health parameter was more significantly reduced.

Conclusions

1. Biliary CP is characterized by abdominal pain more intense than for alcohol CP against CB. In biliary CP intense pain is observed in 53.4%, while in alcoholic CP — 41.5% of cases ($p < 0.05$). In biliary CP against CB pain is often localized pain in epigastrium and both hypochondria (49.4%) and in alcoholic CP — in the left hypochondrium (45.3%). Pain irradiation in biliary CP is often has type of complete belt (42.7%) and in alcoholic CP — type of left half belt (41.5%).

The most frequent dyspeptic phenomena indicated by patients with biliary CP was a bitter taste in mouth (56.0%) and by patients with alcoholic CP — nausea (43.4%). Pancreatic exocrine and endocrine insufficiency and asthenia are expressed significantly greater in alcoholic CP against CB.

Clinical manifestations of chronic bronchitis do not have differences from the classical course.

2. Patients with alcoholic CP against CB had phenomenon of ‘enzymatic deviation’ in blood due to increased activity of pancreatic isoamylase in blood and urine. The same type of pancreatitis against CB is characterized by increased uroamilase debits and induction of endogenous pancreozymin coefficient but without adverse signs of complicated outflow of pancreatic secretion. Biliary CP is

characterized by increased D3 and K2 with imbalance D2 and D3 and K1 and K2 ratios what is indirect signs of difficult pancreatic secretion outflow.

According to the results of fecal elastase test, severe pancreatic insufficiency in alcoholic pancreatitis occurs in 2.82 times more frequently than in biliary pancreatitis ($p<0.05$). Also, direct tube study after administration of pancreatic secretion stimulants in alcoholic CP revealed a significant decrease in lipase and trypsin debit hours ($p < 0.05$), but in biliary CP — reduced amount of pancreatic secret ($p < 0.05$).

Lower obstructive type of pancreatic secretion (48.0%) was the most common in patients with biliary CP compare with aclocholic CP ($p<0.05$) while hyposecretory type of pancreatic secretion (30.2%) was much more common in patients with alcoholic pancreatitis.

As for pancreatic endocrine function blood glucose and immune reactive insulin parameters were not significantly different form values of healthy subjects.

3. Biliary CP against CB more often compared with alcoholic CP is characterized by enlargement of whole pancreas or its part and reduced echogenicity of organ parenchyma and dilation of Wirsung's duct ($p<0.05$). For alcoholic CP L index is increased and histographic coefficient of ultrasonic pancreatic histogram is reduced more significantly ($p < 0.05$).

4. For CP against CP all quality of life parameters which characterize physical and mental health are significantly reduced ($p < 0.05$), and for alcoholic CP pain and general health are decreased more significantly than for biliary CP ($p < 0.05$).

The study prospects include developing dual pathology treatment strategy.

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Clinical characteristics, functional and structural changes of pancreas in patients with combination of chronic pancreatitis and chronic bronchitis

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Key words: chronic pancreatitis, chronic bronchitis, clinical picture, functional state of pancreas, sonography, quality of life

Author examined 128 patients with combination of chronic pancreatitis (CP) and chronic bronchitis (CB) and got the following results. More intense chronic abdominal pain is typical for biliary pancreatitis than for alcoholic CP on the background of CB. Chronic intense pain was observed in 53.4% of cases upon biliary pancreatitis and in 41.5% of cases upon alcoholic CP — ($r<0.05$). Patients with biliary pancreatitis often indicated bitter taste in their mouth (56.0%) among dyspeptic phenomena, and patients with alcoholic pancreatitis — nausea (43.4%). Clinical manifestations of CB do not differ from the classical course.

Alcoholic pancreatitis on the background of CB is characterized by phenomenon of ‘enzymatic deviation’ in blood by increasing activity of pancreatic isoamylase in blood and urine. The same type of pancreatitis on the background of CB is characterized by increased uroamilase debits and induction of endogenous pancreozymin coefficient but without adverse signs of complicated outflow of pancreatic secretion. Biliary pancreatitis is characterized by indirect signs of complicated pancreatic secretion outflow.

According to the results of fecal elastase test, severe pancreatic insufficiency in alcoholic pancreatitis occurs in 2.82 times more frequently than in biliary pancreatitis. Lower obstructive type of pancreatic secretion (48.0%) was the most common in patients with biliary pancreatitis, while hyposecretory type of pancreatic secretion (30.2%) was much more common in patients with alcoholic pancreatitis than in patients with biliary pancreatitis ($r<0,05$).

Sonography more often shows enlargement of the pancreas or its part and reduced echogenicity of organ parenchyma and dilation of Wirsung’s duct in biliary

pancreatitis on the background of CB than in alcoholic pancreatitis. Increased pancreatic tissue echogenicity, pseudocyst and calcifications in tissue are more often observed in alcoholic pancreatitis than in biliary pancreaitis.

Both CP and CB significantly reduced quality of life.

Table 1

Result of pancreatic functional status study by tube free methods

Parameter	All patients		Patient with alcohol CP		Patient with biliary CP		Healthy subjects	
	n	M±m	n	M±m	n	M±m	n	M±m
α-amylase in blood, mckat/l	128	1.91±0.54	53	2.13±0.18*	75	1.74±0.22	30	1.16±0.45
α-amylase in urea, mckat/l	128	6.83±0.61	53	7.19±0.42*	75	6.52±0.54	30	5.08±0.68
P-izoamylase in blood, mckat/l	128	1.39±0.14*	53	1.64±0.07*/**	75	1.11±0.19	30	0.71±0.12
P-izoamylase in urea, mckat/l	128	5.68±0.34*	53	7.16±0.28*/**	75	4.21±0.51	30	3.09±0.42
Uroamylase debit, mckat/l: D1 D2 D3	128	 28.54±1.69 49.54±2.32* 52.12±2.18*	53	 30.76±1.63* 57.84±3.33*/** 53.31±1.42*	75	 26.36±1.74 41.18±3.07 50.82±1.36*	30	 24.63±1.98 33.82±4.96 31.99±3.32
Induction of endogenous pancreozymin coefficient : K1 K2	128	 1.74±0.11* 1.83±0.12*	53	 1.88±0.04*/** 1.73±0.09*	75	 1.56±0.12 1.93±0.14*	30	 1.36±0.09 1.31±0.07
Blood lipase, U/l	128	35.0±7.0	53	43.0±4.0*/**	75	28.0±5.0	30	24.0±8.0
Blood glucose, mmol/l	128	5.50±0.08	53	5.50±0.04**	75	5.30±0.07	30	5.10±0.05
Blood serum insulin, mckat/ml	128	9.5±1.3	53	9.7±1.9	75	9.3±2.2	30	13.4±1.7
Fecal pancreatic elastase-1. mcg/g	128	186.2±13.9*	53	162.8±12.7*	75	196.2±13.8*	30	423.1±12.4

Note: * — difference between patients and healthy subject parameters is significant ($p<0.05$);

** — difference between patients with alcoholic and biliary CP parameters is significant ($p<0.05$).

Table 2

Results of direct (tube) study of pancreatic exocrine function in examined patients

Parameters	Patient with alcohol CP		Patient with biliary CP		Healthy	
	n	M±m	n	M±m	n	M±m
Basal secretion						
Volume, ml/15 min	53	15.8±1.4	75	16.1±1.7	30	18.4±1.3
Lipase debit, U/l/15 min	53	10344±1083	75	10407±1022	30	12106±1104
Trypsin debit, U/l/15 min	53	6151±352	75	6092±341	30	6390±240
α-amylase debit, mccat/l/15 min	53	722±41	75	714±46	30	816±41
P-isoamylase debit, mccat/l/15 min	53	767±28	75	776±34	30	837±32
Bicarbonates debit, mg/eq/l/15 min	53	0.49±0.08	75	0.48±0.07	30	0.63±0.05
Stimulated secretion						
Volume, ml/15 min	53	142.8±12.7	75	104.6±12.1*/**	30	176.6±14.3
Lipase debit, U/l/15 min	53	104580±4382*	75	118396±3152**	30	128323±4760
Trypsin debit, U/l/15 min	53	98351±1547*	75	97102±1601*	30	115020±1640
α-amylase debit, mccat/l/15 min	53	9813±724	75	9782±796	30	11424±806
P-isoamylase debit, mccat/l/15 min	53	8974±781	75	8903±803	30	11132±784
Bicarbonates debit, mg/eq/l/15 min	53	7.90±0.70	75	8.10±0.40	30	8.30±0.70

Note: * — difference between patients and healthy subject parameters is significant ($p<0.05$);
** — difference between patients with alcoholic and biliary CP parameters is significant ($p<0.05$).