

# CLINICAL AND DIAGNOSTIC FEATURES OF CHRONIC PANCREATITIS IN TRANSCARPATHIA

V. Y. Koval

*Uzhgorod National University, Ukraine*

**Key words:** chronic pancreatitis, densitometry, maldigestion, malabsorption, blood macrolevels

Chronic pancreatitis (CP) is a common disease: in different countries, the incidence of CP is 5-7 new cases per 100 000. However, increase in the incidence of pancreatitis has approximately doubled over the last 40 years [2, 6]. This is due not only to the improved methods of CP diagnostics, but to the increase in alcohol consumption in some countries, increased effect of adverse environmental factors that weaken various defense mechanisms [5, 7]. Pancreatic disease took the 4th place in the structure of digestive diseases in all the Transcarpathian population in 2009-2012. Tendency of increasing incidence and prevalence of pancreatic diseases, such as CP, has been preserved in Transcarpathia in recent years.

CP is accompanied with exocrine function deficiency, which usually occurs in the later stages of the disease when progression of organ's fibrosing leads to the decreased production of enzymes, which in turn contributes to the clinical manifestations of malabsorption. Malabsorption of fats and proteins, which is accompanied with deficient absorption of fat-soluble vitamins, will be subsequently combined with mineral deficiency due to malabsorption of calcium and other macroelements. Synthesis and transport of enzymes and electrolytes through the intercellular and intracellular membranes of energy is provided by ATP activity involving calcium ions. In addition, studies show that removal of extracellular  $\text{Ca}^{2+}$  inhibits amylase extrusion by pancreatic acinar cells [8]. It is also determined that the production of secretin, pancreozymin and pancreatic enzymes is calcium-dependent. Thus, calcium promotes the pancreozymin release by the duodenal mucosa and mediates its effect on pancreocytes, participates in the regulation of contractile activity of the Oddi's sphincter [3]. Calcium is also involved in stimulating the

release of enzymes from acinar cells, activating the enzymes and stabilizing the structure of their molecules [4]. Sodium and potassium are involved in the transport of various substances to the cells, thus providing their functioning.

On the basis of the comprehensive study of bone and metabolic changes it is revealed that osteodeficit in CP is of osteoporomation nature, with osteoresorption predominating over osteoformation, thus progressing in the deepening of mineral-vitamin and protein metabolism disorders, having polynutrient nature [1].

**Aim of the research** is to study the clinical and diagnostic features of different forms of CP in Transcarpathia.

**Materials and methods.** We analyzed medical records of 85 hospitalized patients with CP (39 — chronic pseudotumorous pancreatitis (CPTP), 21 — chronic calculous pancreatitis (CCP), 25 — chronic parenchymal pancreatitis (CPP)), which were treated at the gastroenterological department of the Transcarpathian Regional Clinical Hospital n. a. A. Nowak in 2009-2013. CP was diagnosed on the basis of complaints of patients, disease history, physical data, data of ultrasonography and computed tomography of the pancreas, pancreatic amylase in the blood and urine, macronutrient content in serum, morphological pancreatic studies of patients with previous history of pancreatic necrosis, coprogram data according to the Marseille-Rome classification of chronic pancreatic diseases (1989) amended by Y. S. Zimmermann (1995). Some of the patients underwent densitometry of the lumbar spine and hip joints.

**Results and discussion.** Examined group consisted of: female — 25%, male — 75%. Male/female ratio in: CPTP — 5.5, CCP — 6, CPP — 1.08. Disease duration was upon: CPTP  $2.44 \pm 0.22$ , CCP —  $5.43 \pm 0.63$ , CPP —  $7.28 \pm 0.5$ . Peculiarities in the CP course depending on the disease duration in these patients were not observed. In the clinical course of CPP pain was detected in 82% of patients, general weakness — in 56%, weight loss — in 44%, tendency to diarrhea — in 36% of patients. Upon CCP pain was noted in 76%, weakness — in 57%, weight loss — in 52%, tendency to diarrhea — in 48% of patients. 84% patients with CPTP showed pain, 68% — general weakness, 44% — the tendency to diarrhea, 40% —

swelling belly. Upon fibroesogastroduodenoscopy, erythematous and erosive gastropathy was detected in 54% of cases with CPTP, 56% — CCP, 52% — CPP. Characteristics of patients' complaints depending on the CP form are shown in Fig. 1.



Fig. 1. Characteristics of the main complaints of CP patients.

In conducting the coprological examination of feces in CP patients, attention was paid to the presence of cellulose, starch, undigested muscle fibers, neutral fat, fatty acids, soaps. Upon CPTP we detected starch and fiber —  $1,33 \pm 0,21$ ; neutral fat —  $1,83 \pm 0,17$ ; fatty acids —  $2,13 \pm 0,23$ ; soaps —  $1,5 \pm 0,5$ ; undigested muscle fibers —  $1,57 \pm 0,2$ . Upon CCP: cellulose —  $1,5 \pm 0,5$ ; starch, undigested muscle fibers and soap —  $1,2 \pm 0,2$ ; neutral fat and fatty acids —  $1,4 \pm 0,24$ . Upon CPP: cellulose —  $1,56 \pm 0,12$ ; starch —  $1,44 \pm 0,13$ ; neutral fat —  $1,63 \pm 0,16$ ; fatty acid —  $1,71 \pm 0,16$ ; Soap —  $1,5 \pm 0,23$ ; undigested muscle fibers —  $1,92 \pm 0,23$ . Presence of cellulose, starch and soap was equally observed in all the CP forms. Significant increase in neutral fat was observed in CPTP compared with CCP patients, as well as significant increase in fatty acids compared with CCP and CPP patients. We observed a significant increase of undigested muscle fibers in CPP patients compared with CCP ones (Table 1).

Table 1

### Indices of coprological examination of feces in CP patients

Indices	CPTP	CPP	CCP
Cellulose	1.33±0.21	1.56±0.12	1.5±0.5
Starch	1.33±0.21	1.44±0.13	1.2±0.2
Undigested muscle fibers	1.57±0.2	1.92±0.23***	1.2±0.2
Neutral fat	1.83±0.17*	1.63±0.16	1.4±0.24
Fat acids	2.13±0.23*	1.71±0.16**	1.4±0.24
Soaps	1.5±0.5	1.5±0.23	1.2±0.2

Note: \* — significant difference between the CPTP and CCP indices; \*\* — significant difference between the CPTP and CPP indices; \*\*\* — significant difference between the CPP and CCP indices.

Upon the examination of macronutrient content in the blood of CP patients, we found insignificant reduction of sodium in patients with CPP — 139.04±1.16, CPTP — 120.04±17.31, CCP — 112.20±26.35 compared with the control group — 140±5.0. Potassium and chloride in patients with various forms of pancreatitis ranged within the control group. Calcium scores decreased in CPTP and CCP patients to the minimum limit of normal.

Content of macronutrient levels in various CP forms is shown in Table. 2.

Table 2

### Blood macrolevels upon various CP forms

Indices	CPP (n=27)	CPTP (n=18)	CCP (n=15)	Control group (n=20)
Calcium, mmol/L	1.37±0.07	1.22±0.03	1.10±0.015	1.57±0.58
Sodium, Ommol/L	139.04±1.16	120.04±17.31	112.20±26.35	140±5.0
Chlorine, Ommol/L	101.55±0.96	101.66±5.85	100.42±3.84	100±20
Potassium, mmol/L	4.33±0.12	4.45±0.15	4.42±0.14	4.27±1.28

Densitometry of the lumbar spine and hip joints detected osteoporosis in 62% of CP patients and osteopenia in 71% of patients, although calcium indices were at the lower limit of normal.

### Conclusions:

1. In Transcarpathia men are down with CCP and CPTP in 5.5-6 times more often. Pain is a dominant symptom upon various CP forms in 76-84% of patients. Significant weight loss is detected in 44-52% of CPTP and CCP patients. Tendency to diarrhea is the same in all the CP groups.

2. 40-54% of CP patients have gastropathy.
3. More evident manifestations of maldigestion accompanied with evident steatorrhea are observed in CPTP patients. Amylorrhoea is equally evident upon all the CP forms. Creatorrhea is more evident in CPP patients.
4. CP patients have insignificant decrease of calcium and sodium in blood macrolevels, which is more evident in patients with complicated forms of pancreatitis — CPTP and CCP.
5. Densitometry of the lumbar spine and hip joints makes it possible to detect the signs of osteoporosis and osteopenia in the early stages of malabsorption syndrome in CP patients.

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*Uzhgorod National University, Ukraine*

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Article presents the clinical and diagnostic features of chronic pancreatitis (CP) in Transcarpathia. Males with chronic calculous and pseudotumorous pancreatitis suffer in 5.5–6 times more often. In the clinical course in all CP forms pain prevailed in 76–84% of patients, significant weight loss — in 44–52%, unstable feces — in 42–46%. Gastropathy was found in 40–54% of patients with CP. Feces study in patients with chronic pseudotumorous pancreatitis observed more evident manifestations of maldigestion accompanied by steatorrhea. Amylorrhoea was equally evident in all CP forms. Creatorrhea was more evident in patients with chronic parenchymal pancreatitis. Reduction of blood macronutrients calcium and sodium was shown in patients with CP, being more evident in those with complicated forms of pancreatitis — chronic pseudotumorous and calculous ones. Bone densitometry allowed to detect osteoporosis and osteopenia at the earliest manifestations of malabsorption syndrome in patients with CP.