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Therapeutic Outcomes Of Enzyme Replacement In Patients With Chronic Pancreatitis

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Abstract: In chronic pancreatitis, increased levels of vitamin 25-OH-D deficiency are associated with concomitant risk factors in patients, the course of the disease, the degree of pancreatic fibrosis and calcification, impaired digestion and absorption of macro- and micronutrients due to a decrease in its exocrine function, which requires the development of effective approaches to treatment and prevention, as well as the development of long-term enzyme therapy to improve quality of life. The article below is devoted to the importance of enzyme therapy in the course of chronic pancreatitis.

Keywords: Hypovitaminosis D, chronic pancreatitis, enzyme therapy, steatorrhea, amylorrhea, creatorrhea, malabsorption.

Introduction: According to the World Health Organization, chronic pancreatitis is a common disease, accounting for 0.2–0.6% of the total incidence and 5.1–9% of gastrointestinal diseases. Chronic pancreatitis occurs in 5–6 cases per 100,000 people in developed countries, while worldwide this figure is 1.6–23 per 100,000 people. Currently, the sharp increase in the incidence of chronic pancreatitis among the population is associated with malnutrition, chronic stress, environmental pollution, irregular medication intake, infection and other factors. The classic complications of long-term chronic pancreatitis are insufficiency of the exocrine function of the pancreas, the development of maldigestion and malabsorption syndromes.

Patients with chronic pancreatitis develop insufficiency of the exocrine function of the pancreas, which leads to impaired absorption of dietary fats and fat-soluble vitamins [12; 152-p., 7; 157-163-p.] Vitamin D deficiency is more common in patients with chronic pancreatitis than in the general population [9; 172-p., 8; 57-61-p.]. Clinical data suggest that approximately 40% of patients with acute or chronic pancreatitis have severe vitamin D deficiency; this figure may increase to 60% in chronic pancreatitis [1; 156-160-p, 10; 5779-p.]. This increases development osteoporosis [6; 219-228-p.] muscle relaxation [13; 111-148-p.], infectious diseases [2; 27-30-p .], diseases of the cardiovascular system [5; 5-14-p, 15; 7-12-p.], reproductive disorders [3; 151-p.] in patients. According to the research of Bideeva T.V. and co-authors (2019), prescribing vitamin D to patients with chronic pancreatitis led to normalization of the level of this vitamin in their blood serum [14; 156-160-p.] According to the recommendations of European and Russian pancreatologists, concomitant enzyme therapy for

patients with chronic pancreatitis and pancreatic exocrine function, based on the results of clinical, laboratory and coprological examinations, gives positive results and eliminates vitamin D deficiency [4; 70–97-p., 11; 1604–1613-p.].

METHODOLOGY

Treatment of chronic pancreatitis, its transition to clinical remission and long-term maintenance of remission are directly related to the activity of the exocrine function of the pancreas in patients. Therefore, patients are recommended to undergo adequate enzyme replacement therapy. Based on these basic principles, we set ourselves the goal of evaluating the effectiveness of enzyme therapy not only in the regression of clinical symptoms, but also in the effect on vitamin D, calcium and coprological indicators. To do this, we divided the patients who received inpatient treatment into 2 groups. In our 1st group, 55 patients received enzyme therapy for 3 months after inpatient treatment (main group), in our 2nd group, 25 patients did not receive enzyme therapy after inpatient treatment (comparative group). Enzyme therapy was carried out with the drug minimicrosphere capsular pancreatin (25000 IU). Clinical, biochemical and coprological studies were conducted before and after enzyme therapy.

RESULTS AND DISCUSSION

The results showed that the frequency of complaints before treatment was approximately the same in both the main and comparison groups (Table 1.1). In particular, nausea in 80-100%, rest in the stomach, indigestion, heaviness in the stomach after eating, epigastric pain were observed in 84-100% of cases in both groups of patients. Porous diarrhea was detected in 33-44% of cases, constipation was detected in 36-52% of cases, and lumbar pain was detected mainly in 56-57% of cases.

After three months in the control group, symptoms of diarrhea and constipation decreased by 2, 2 and 4 times in 20 and 8% of patients, respectively. Symptoms of nausea, loss of appetite, rest in the stomach 3.67; 2.78 and 1.67 times decreased to 24.0; It remained in 36.0 and 60.0% of patients. Difficulty in digesting food, the feeling of heaviness after eating was observed in the comparison group of patients and remained in 60 and 64% of patients. Pain in the epigastric region decreased by 3.5 times, while lumbar pain was completely eliminated.

So, in the comparative group, after three months, the clinical symptoms of chronic pancreatitis decreased to a certain extent, but in some cases, they remained.

1.1- Table

Reduction of clinical symptoms of chronic pancreatitis in the main and comparative group patients

Clinical signs	Main group, n=20		Comparison group, n=25	
	Before treatment	After treatment	Before treatment	After treatment
Porous diarrhea	33,3	4,8	44,0	20,0
Constipation	52,4	9,5	36,0	8,0
Nausea	80,9	4,8	88,0	24,0
Vomiting	95,3	9,5	100,0	36,0
Resting in the womb	90,5	14,3	100,0	60,0
Difficulty digesting food	95,2	4,8	100,0	64,0
A feeling of heaviness in the stomach after eating	85,7	14,3	88,0	72,0
Pain in the epigastric	90,5	4,8	84,0	24,0

region				
Lumbar pain	57,1	0,0	56,0	0,0

Regression of clinical signs was more evident in patients who received enzyme therapy for three months. In particular, symptoms of porridge-like diarrhea and constipation decreased by 7 and 5.6 times and remained in only 4.8 and 9.5% of patients. This suggests that 3.2 and 1.4 were significantly more effective than the comparison group. Symptoms of nausea, loss of appetite, rest in the stomach 16.85; 10 and 6.33 times decreased to 4.8; It remained in 9.5 and 14.3% of patients. This compares to a comparison group of 4.6; 3.6 and 3.8 times less meeting was observed. Difficulty digesting food, the feeling of heaviness after eating decreased by 19.8 and 6 times and remained only in 4.8 and 14.3% of patients. It was 13 and 5 times more effective than the control group. Epigastric pain decreased by 18.8 times and remained in 4.8% of patients, while it was 5 times more effective than the control group. Lumbar pain was completely eliminated.

Thus, a sharp decrease in clinical symptoms was observed in the main group of patients, which was significantly more effective than the control group. This, in our opinion, is due to the improved digestive processes due to the introduction of enzymes.

Determination of serum amylase activity in the main and comparative groups after three months showed a statistically significant decrease in it by 1.56 (P<0.05) and 1.78 (P<0.01) times (Table 1.2). This indicates that the disease has entered a period of stable remission. The differences between the groups were insignificant. However, the amount of elastase in the feces remained unchanged in the main and comparative groups. It remained 1.25 (P<0.05) and 1.23 (P<0.05) times lower than the norm in the main and comparative groups. The results obtained indicate that enzyme therapy does not affect the activity of elastase in the feces. The amount of calcium in the blood serum of patients in both groups did not change after three months and remained slightly lower than the norm.

1.2- Table

Serum amylase, calcium, and vitamin 25-OH-D levels in patients in the main and comparison groups

Indicators	Main group, n=20		Comparison group, n=25	
	Before treatment	After treatment	Before treatment	After treatment
Fecal elastase (FE) µg/g	167,10±5,43	166,95±5,31	170,32±4,35	169,88±4,34
Vitamin D, ng/ml	18,35±2,03	25,90±1,89*	18,94±1,67	17,08±1,59
Calcium, mmol/l	1,83±0,05	1,83±0,05	1,81±0,06	1,81±0,06
Amylase, ME/l	113,68+9,56	73,06+3,43*	139,93+13,20	78,56+2,00*

Note: * - results obtained after treatment are statistically significant compared to pre-treatment values, R<0.05.

The serum vitamin 25-OH-D level in the control group of patients tended to decrease after three months and remained 1.52 (P<0.05) times lower than the norm. In our main group, which received enzyme therapy, the serum vitamin 25-OH-D level increased 1.41 (P<0.05) times compared to the pre-treatment level and did not differ from the norm. It was 1.52 (P<0.05) times higher than the control group. The results showed a positive effect of enzyme therapy on the level of vitamin 25-OH-D.

At the same time, we also analyzed the serum levels of vitamin 25-OH-D in patients according to the international vitamin 25-OH-D classification (see Figure 1.1). The analysis showed that in the comparison group, before treatment, 20% of patients had a normal level of vitamin 25-OH-D, 35% had a deficiency, 45% had a deficiency, and 25% had a pronounced deficiency. After three months, a certain change in these indicators was detected. In particular, the number of patients with normal indicators decreased by 4 times, and only 5% of patients had normal indicators. A slight increase in the level of vitamin 25-OH-D deficiency was observed, reaching 40%. Vitamin 25-OH-D deficiency was detected in 45% of patients, while its pronounced deficiency increased to 35%. Thus, a tendency to decrease the level of vitamin 25-OH-D in the blood serum was found in untreated patients, which, in our opinion, leads to the development of osteopenia and osteoporosis in patients.

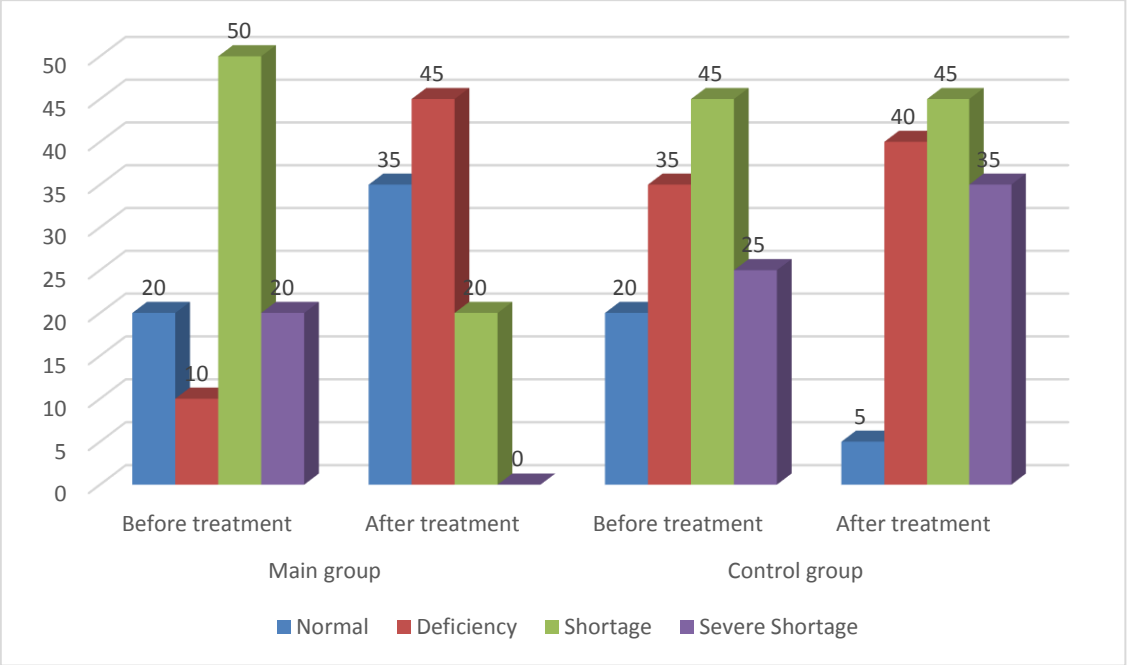

Figure 1.1. Classification of vitamin 25-OH-D levels in patients with chronic pancreatitis in the main and comparison groups before and after treatment (%).

In the main group that received enzyme therapy, an increase in the level of vitamin 25-OH-D in the blood serum of patients was observed after three months. If 20% of the patients in the main group had normal levels of vitamin 25-OH-D before treatment, 10% of the patients had deficiency, 50% had deficiency, and another 20% had severe deficiency. Three-month enzyme therapy increased the number of patients with normal levels of vitamin 25-OH-D to 35%, the number of patients with deficiency increased to 45%, and if the deficiency was 20%, then no obvious deficiency was observed at all. When compared with the indicators of the control group, we can observe a 7-fold increase in the number of patients with normal levels. The number of patients with vitamin 25-OH-D deficiency decreased by 2.5 times, with a clear deficiency of 35% in the comparison group and not observed at all in the main group.

CONCLUSION

Thus, enzyme therapy for patients with chronic pancreatitis after inpatient treatment for three months not only effectively reduces clinical symptoms, reduces hyperamylasemia, and, most importantly, increases serum levels of vitamin 25-OH-D. This leads to an improvement in the patient's condition, prevention of complications of osteopenia and osteoporosis, and improvement in quality of life.

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