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EFFECTIVENESS OF LIPOIC ACID IN THE TREATMENT OF LIPID DISTRESS SYNDROME

N. B. Gubergrits, N. V. Byelyayeva

Donetsk National Medical University n. a. M. Gorky, Ukraine

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Lipid distress syndrome is a systemic pathological reaction of organism based on lipid metabolism’s disorders in sort of pathobiochemical and pathomorphological processes, spreading beyond the target organs and promoting the emergence of new or progressing current diseases [**Ошибка! Источник ссылки не найден.**, **Ошибка! Источник ссылки не найден.**].

The term ‘stress’ was determined by physiologist Gans Selie. Stress is the general reaction of organism to different external stimuluses attended with release of biological active substances to the blood stream. According to the reaction of organism we distinguish eustress, which is normal physiological answer devoted for preservation of life, and distress, which is pathological reaction to the stimulusses attended not only by hyperergical entering of excess biological active substances, but appearance of new pathological components promoting the emergence and progressing of pathological conditions (diseases) [Ошибка! Источник ссылки не найден., Ошибка! Источник ссылки не найден., Ошибка! Источник ссылки не найден.]. During the distress syndrome total organism is included in the systemic dismetabolic process. Severity of patient’s condition is caused by general failures and function failures of certain target organs. Target organs during LDS are arteries, liver, pancreas, gall bladder, exhepatic biliary tracts, intestine, uterus, ENT organs, skin. According to that point, atherosclerosis, nonalcoholic fatty liver and pancreas disease, cholesterosis of gall bladder, biliary sphincters (Oddy’s sphincter), lipomatosis of ileocecal valve, uterine myoma, angiogenic cochleovestibular disorders, xanthoms and xanthelasms are developing during the LDS [Ошибка! Источник ссылки не найден., Ошибка! Источник

ссылки не найден., Ошибка! Источник ссылки не найден., Ошибка! Источник ссылки не найден., Ошибка! Источник ссылки не найден., Ошибка! Источник ссылки не найден., Ошибка! Источник ссылки не найден.].

LDS is forming against a background of lipid metabolism's disorders — hyper- or dislipoproteinemia. Lipid composition of blood is always changed against a background of microecological disorders in intestine. Microorganisms of digestive tract involve into cholesterol metabolism and have an effect on enzymatic systems of master's cells participating in recycling of biliary acids and synthesizing the endogenic cholesterine. Increased reproduction of bacteria in small intestine leads to increased decojugation of conjugate biliare acids and formation its toxic endogenic salts disturbing the microcirculation the resorption of practically total pool of biliary acids with its subsequent entrance to the liver. Synthesis of biliary acids decreases in hepatocytes, the amount of cholesterin increases in blood plasma because of no need for its using for synthesis of biliary acids. Natural mechanism of cholesterol homeostasis, which is enterohepatical circulating of biliary acids, fails, dislipoproteinemia is forming. During the disorder of enterohepatical circulation of biliary acids and syndrome of increased reproduction of bacteria in intestine, increased quantity of endotoxin of gram-negative flora enters the liver with blood. As the results, there are depression of reticuloendothelic system of liver, activization of sequence of cytokine cascades, peroxidation of lipids, suppression of antioxidant defence of organism. Creation of dysmetabolic terms for realization of cholesterol aggression in target organs and forming of LDS is included [Ошибка! Источник ссылки не найден., Ошибка! Источник ссылки не найден., Ошибка! Источник ссылки не найден., Ошибка! Источник ссылки не найден., Ошибка! Источник ссылки не найден., Ошибка! Источник ссылки не найден., **Ошибка! Источник ссылки не найден.**].

Treating of LDS must include number of directions (fig. 1). As we see from the algorithm from the figure 1, treating of LDS includes surgical blockade of enterohepatical circulation of biliary acids. Usually, operation of partial ileoshunting is used [Ошибка! Источник ссылки не найден., Ошибка! Источник ссылки не найден.].

Fig. 1. Algorithm of LDS treatment (by V. A. Petukhov (2003) [**Ошибка! Источник ссылки не найден.**], revised and supplemented by N. B. Gubergrits)

Conservative blockade is meant by using vaseling-pecting emulsion FIShant-C. Under the influence of body temperature in the small intestine emulsion disintegrates to mineral butter and pectine. Mineral butter forms layer at the mucous of ileum and reverse resorption of biliary acids (for 24–26 hours) by breaking its enterohepatical circulation FIShant-C's effect by effectivness is closed to ileoshunting and statins [**Ошибка! Источник ссылки не найден.**, **Ошибка! Источник ссылки не найден.**, **Ошибка! Источник ссылки не найден.**], Duphalak and Creon [**Ошибка! Источник ссылки не найден.**] are added the algorithm of treting to correct intestinal dysbiosis, malassimilation of nutrients. Duspatalin is prescribed for abdominal pain.

Because of the most expressive damage of target organs, which is nonalcoholic fatty liver and pancreas disease, patients are suggested for hepatoprotectors possessing the ability of decreasing expression of fatty dystrophy of organs and having antioxidative properties. According to the fact, that during LDS lipid

infiltration is developing for the whole number of target organs (see above), optimal prescription of medicine is that, which can optimize lipid, carbohydrated, energetic metabolism not only in liverand pancreas, but also in the whole organism. Such medicine is the Dialipon (α-lipoic acid).

α-lipoic acid and 1,2-ditiolan-3-pentane acid is the dithyol combination of natural origin, which is synthesizing of octanic acid by enzymes in mitochondria. α-lipoic acid exists in two kinds, like right-rotate and left-rotate forms. But, there is only right-rotate isoform, which is an important co-factor at biological systems.

Bacteriologist I. C. Gunsalus discovered lipoic acid (tyoctive acid) in 1948. Researches of aerobian bacteria found stopping of its increasing without pyruvate-oxidant factor (lipoic acid). L. Reed isolated lipoic acid in crystalline form from the extract of beef liver in 1951. D. J. O'Kane et al. decoded chemical composition of lipoic acid in 1952. First message about therapeutic using of lipoic acid was from C. Rauch at the international symposium at Tokyo in 1955 — effectivness in treatment of liver disease, liver coma, intoxications (including alcoholic) was recognized [Ошибка! Источник ссылки не найден., Ошибка! Источник ссылки не найден., Ошибка! Источник ссылки не найден.].

Biosynthesis of lipoic acid de nova supplies organism's needs of it as coenzyme, biosynthesis can be made by bacteria, plants, high organisms, the main sources among the food products are lean meat, heart, kidneys, liver and less fruits and vegetables [**Ошибка! Источник ссылки не найден.**].

Pharmacokinetics of lipoic acid has its own features. Half-life is 30 min, general plasma clearance — 10–15 ml/min/kg. After 30 min of infusion of 600 mg of α-lipoic acid its concentration in plasma is about 20 mcg/ml; it's absorbing fast and almost totally from gastrointestinal tract during intake. Kidneys exteriorize 93–97% of α-lipoic acid in form of metabolits. Biotransformation occurs in liver by oxidative contraction of lateral chain and/or by S-methyling proper thyoles. α-lipoic acid is incompatible with glucose solutions, Ringer solution, with complex of metal ions; it makes hardly soluble complex compositions with glucose molecules [**Ошибка! Источник ссылки не найден.**].

α-lipoic acid runs like coenzyme at multienzymatic mitochondrial complex [Ошибка! Источник ссылки не найден., Ошибка! Источник ссылки не найден.].

Reactional ability of lipoic acid is mostly makes conditional on its dythiol ring. Oxidative and reduced (dyhydrolipoic acid — DHLA) forms make powerful oxidative-reduced couple. It's proved that both forms can link active radicals of oxygen [**Ошибка! Источник ссылки не найден.**, **Ошибка! Источник ссылки не найден.**].

Mechanism of antioxidative function of lipoic and dyhydrolipoic acids includes next [Ошибка! Источник ссылки не найден., Ошибка! Источник ссылки не найден., **Ошибка! Источник ссылки не найден.**]:

- Reduced form of DHLA is a donor of electrons for reducing another antioxidants (vit. C, vit. E and glutation);
- In an atmosphere of massive oxidation DHLA makes recycle of vit. E during its exhaustion;
- α-lipoic acid increases intra- and extracellular levels of glutation at T-cellular cultures, human erytrocytes, cells of glia and lymphocytes of peripheral blood;
- By reducing to DHLA α-lipoic acid supplies permanent decreasing of extracellular cystein and increasing of intracellular cystein, which is a part of glutation;
- Dyhydrolipoate reduces intracellular concentration of Fe^{2+}, preventing its participation in lipid peroxidation;
- α-lipoic acid and DHLA capture free radicals; neutralize effectively peroxidative and hydroxydative radicals and also oxygen's radical;
- α-lipoic acid makes complex with manganese, zinc, cadmium, lead, cobalt, nickel, iron; leads out of tissues mercury, copper and arsenic [Ошибка! Источник ссылки не найден., Ошибка! Источник ссылки не найден.];
- α-lipoic acid has a positive lipotropic effect making easier transportation of acetate and fatty acids from cytozol to the matrix of mitochondria for the following oxidation by increasing of producing the CoA; moves spectrum of blood lipids to the side of unsaturated fatty acids, preventing the developing of

atherosclerosis; mobilizes lipids from lipid depot with its following utilization from energetic metabolism [Ошибка! Источник ссылки не найден., Ошибка! Источник ссылки не найден., Ошибка! Источник ссылки не найден.].

Lipoic acid takes part into the carbohydrate metabolism, exactly in the aerobian metabolism of product, which is pyruvate; it is a coenzyme at the oxidative decarboxylation of pyruvic acid and α-ketoglutarate acid at Creb's cycle, making easier transformation of lactic acid into pyruvic acid with its decarboxylation it assists liquidation of metabolic acidosis; regulates synthesis of glycogen at the liver; increases interaction of insulin and receptors, increases activity of glucose transporters and intracellular transport of glucose; slows down the processes of gluconeogenesis and ketogenesis [Ошибка! Источник ссылки не найден., Ошибка! Источник ссылки не найден., Ошибка! Источник ссылки не найден.].

Medicines of lipoic acid, especially Dialipon, have a high expressed neuroprotective effect: these medicines reduce lipid peroxydation at the peripheral nerves and improve endoneural blood stream increasing installation speed of neural impulse and normalizing level of glutation at nerves. Lipoic acid stimulazes growing of axons and its branching, and also new neural fibers. Having a positive lipotropic effect lipoic acid makes easier transportation of acetate and fatty acids from cytozol to the matrix of mytochondria for the following oxidation by increasing of producing CoA [Ошибка! Источник ссылки не найден., Ошибка! Источник ссылки не найден., Ошибка! Источник ссылки не найден., **Ошибка! Источник ссылки не найден.**].

Energetic properties of lipoic acid are very important for the clinical practure. These properties promote capture and utilization of glucose at muscle tissue independently of insulin action; increase level of macroergical compositions at skelrton muscles; correct failed metabolism of iron and copper [**Ошибка! Источник ссылки не найден.**, **Ошибка! Источник ссылки не найден.**].

Immunotropic effect of lipoic acid consists of normalusation of cell-mediated immunity increasing low level of all subpopulations of T-lymphocytes; reducing high level of interleukin-I and tumor-necrosing factor; regulation of natural killers activity

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Medicines of lipoic acid have found a whole utility in gastroenterology and hepatology especially. It assists by the fact, that lipoic acid takes part in the cellular energy supply and prevents developing of ketoacidosis, shows lipotropic, x-ray protective and antioxidative effect, suppresses the synthesis of NO by hepatocytes, links metals [Ошибка! Источник ссылки не найден., Ошибка! Источник ссылки не найден., Ошибка! Источник ссылки не найден.].

D. V. Dmitriev with co-authorship demonstrated the effectiveness of Dialipon in treating of child toxic hepatitis. It has been demonstrated that during addiction of medicine to the complex therapy, ALT and AST, whole and conjugated bilirubin clinical manifestations are reducing reliably [**Ошибка! Источник ссылки не найден.**].

Lipoic acid showed its effectiveness against alcoholic liver affection. Usually low doses of α-lipoic acid (under 300 mg/day) are used in treating of such pathology, but even of these doses it is effective for all the phases of alcoholic liver disease. Safety of higher doses (under 1200 mg/day) is improved. According to data of U. A. Kravchuk et al. (2004) treatment of 61 patients with alcoholic hepatitis by α-lipoic acid in dose of 600 mg/day assisted reducing of expression of fatty liver dystrophy and index of histological activity. It is demonstrated, that α-lipoic acid and medicines of essential phospholipids possess synergism during alcoholic liver affections [**Ошибка! Источник ссылки не найден.**].

Lipoic acid is effectively during viral hepatitis, particularly, during chronic viral hepatitis C. Using of triple antioxidative plan (α-lipoic acid, silimarin, selen) is cheap and safe way of treating nonrespondents during hepatitis C, it assists inhibition of fibrosis and progression of liver cirrhosis, reduces risks of hepatocellular carcinoma’s developing. Using o α-lipoic acid is concerned as first-line therapy for chronic hepatitis B and C in case of contraindication or non-effectiveness of antiviral therapy [**Ошибка! Источник ссылки не найден.**].

Experience of treatment of nonalcoholic fatty liver disease by lipoic acid was published by S. D. Podimova (2005). She demonstrated that α-lipoic acid per os is in dose of 300 mg 3 times per day assists reducing of expression and dissapearing of asthenic, dyspepsia syndroms for the mostly of patients.

Positive dynamic of laboratory rates is mentioned with reducing enzymes of cytolisis and cholestasis, cholesterin for mostly of patients: activity of ALT reduced 1,68 times, AST — 1,60 times. Author considers advance intravenous injection of α-lipoic acid is necessaryvfor reducing enzymes of cytolisis and cholestasis till normal rate in patients with long period of disease. Side effects and aftereffects during use of medicine weren't mentioned.

α-lipoic acid is effective against severe liver diseases, particularly against cyrrhosis. It reduces manifestations of liver encephalopathology by reducing ammount of ammonia in blood of patients with hyperammonemia attended by portacaval shunts. Positive therapeutic effect in patients with liver cyrrhosis is noted 4–11 day of using the lipoic acid in dose of 600 mg/day. According to lipotrophic properties it can easy penetrate through hepatoencephalic barrier and neutralize peroxydative lipid products at central neural system [**Ошибка! Источник ссылки не найден.**].

It was demonstrated on animals that α-lipoic acid and DHLA prevent death of neurons during experimental liver ischemia and following reperfusion (it's explained by the fact that α-lipoic acid increases considerably the concentration of glutation at neural tissue and defends neurons from toxic peroxyds) [Ошибка! Источник ссылки не найден., Ошибка! Источник ссылки не найден.].

Lipoic acid is also uses for the treatment of cholecystitis. One of the leading causes of aftereffects of cholecystitis is the functional liver disorder, especially in patients with long anamnesis and often exacerbations. Using of α-lipoic acid in complex with preoperative preparation and during postoperative period assists faster and expressive normalization activity of LDS and maleic dehydrogenase in patient's blood. Preoperative preparation with including of lipoic acid makes favourable background for early surgery, while using the medicine after surgery is one of the

preventive measures against hidden liver failure [**Ошибка! Источник ссылки не найден.**].

α-lipoic acid is indicated for pancreatic diabetes (damage and death of insular cells are mediated by effect of antiiflammatory cytokines and nitroxyde, that's why lipoic acid is necessary to iclude to the therapy). During preventive injection of α-lipoic acid production of nitroxyde by pancreatic b-cells is reducing. Besides, α-lipoic acid is indicated for the treatment of chronic pancreatitis connecting with fatty pancreas dystrophy [**Ошибка! Источник ссылки не найден.**].

According to its universal metabolic effect lipoic acid is used in endocrinology, neurology, gastrpoenterology, gynecology, obstetrics, venereology etc. [**Ошибка! Источник ссылки не найден.**, **Ошибка! Источник ссылки не найден.**].

Dialipon has advantages over other medicines of lipoic acid:

- better profile of safety — methyl glucamine salt is using as the stabilizator, but not the ethylene diamine one;
- polyethyleneglycol is using as an extra component (solvent/preservative), but not the propylene glycol and benzyl alcohol;
- high quality — Italian substance, sertified by GMP;
- the most acceptable price for patients;
- improved effectiveness;
- comfortable using — different forms of production and variety of doses.

Using of methyl glucamine salt as a component of Dialipon is a matter of principle, because of ethyldiamine toxicity. Particularly 3–12 months after the beginning of workship with ethyldyamine 34% of workers noted hardly treating dermatitises, allergic rhinitises and rhynopharyngitises, attacks of bronchial asthma (first mentioned), headaches, dizziness, undue fatigability, reducing of memory and attention, tremor of hands. Many cases of deathful poisoning by ethyldyamine were described [**Ошибка! Источник ссылки не найден.**].

Side effects during the treatment by Dialipon developed rarely and come to allergic manifestations or to the occurrences of hypoglycemia after fast injection of medicine.We conducted our own research.

Research objective is to estimate the effectiveness of Dialipon in treating patients with LDS with connection of nonalcoholic fatty liver disease and atherosclerosis.

Materials and methods. 62 patients with LDS were examined, the manifestations of its LDS were nonalcoholic steatohepatitis with minimal activity, nonalcoholic fatty pancreas disease (chronic steatopancreatitis), atherosclerosis of aorta and its large branches and also obesity of I–III phases. All patients got their treatment at the gastroenterological clinic department of internal medicine n. a. Professor A. Y. Gubergrits of Donetsk National Medical University.

There were more women among the examined (82,3%). More often age of patients was 60–65. Generally age of examined patients varied from 52 till 68.

30 healthy people were examined, their sex and age were compared with the same characteristics of examined patients.cAning healthy people there were 24 (80,0%) women and 6 (20,0%)men of age from 58 till 65 (group of comparison).

All the patients were examined in detail for complaints, anamnesis, objective, laboratory and instrumental examination.

Whole blood analysis, biochemical blood research (whole protein,proteinogramm, aminotransferases — ALT, AST, whole bilirubin and its fractions, alcaline phosphatase — AP, gamma-glutamyl transpeptidase — GGTP, cholesterin, lipoproteins, glucosa), whole urine research, coproscopy were made to all patients.

External secretory pancreas function was estimated by identification of levels of α-amylase in blood and urine, pancreatic isoamylase (P-isoamylase) in blood and urine; activity of lipases in blood; pancreatic elastase-1 content in stool.

Activity of α-amylase and P-isoamylase at biological fluids was researched by biochemical analisator Vitalb Flexor-2000 (Netherlands) with using the set firm Lachema (Chech Republic).

Rates of blood lipase were made by kinetic calorimetrical method with arts of Sentinell (Italy) using the same biochemical analisator.

Fecal pancreas elastase-1 was identified by test-sets of Shebo using immunoenzymatic analisator Sanofi (France).

The rest of biochemical tests were made by generally methods, generally adopted criteria were used for its estimate.

US of organs of abdominal cavity and peritoneal space was made by apparatus ALOKA-SSP-63. Besides the subjective estimate of pancreas ultrasonography we calculated the rate of homogeneity (N) its tissue, gystographical koefficient (kgst), we take into account the L rate of ultrasonic gystogramm of head of pancreas. During the liver gystography we took into account only L-rates. Rates of ultrasonic pancreas gystogramm of healthy people were the next: L — 17,3+/-0,5, N — 15,20+/-0,05%, K_{gst} — 122,4+/-12,3, L at the right lobe of liver — 21,6+/-0,8.

Characteristics representing the condition of extrasecretory pancreas function were made twice. Ultrasonic gystography of pancreas was also made twice. First research was made after patients admission to the hospital (on 2–3 day of hospital stay), and second was made after the end of treatment.

Statistic processing of receiving data was made on computer by using standard programm pack of Microsoft Excel. Average quantity (M) and its mistake (m) were calculated. Possibility of receiving data was estimate by student criteria, which supplied the possibility (p) no less than 95%.

Patients were divided in two groups according to the treatment they gained. Patients of main group — 32 patients (51,6%) received medicines of basic medical complex prescribing traditionally for the treatment of such diseases. Besides, Dialipon was prescribed for the patients of main group in dose of 600 mg for drop-by-drointroduction by physiological solution 1 time a day during 10 days, and after that in dose 600mg 3 times a day per os during a month. Patientsvof control group — 30 patients (48,3%) received only basic therapy. Medicine silimarin was used as hepatoprotector.

Results. Positive dynamic of pain syndrome under influencevof treatment was expressed more for the patients of main group. It turned out, that pain dissapeared at 7 (21,9%) patients, reduced at 21 (65,6%) patients, stayed without changes at 2

(6,3%) patientsvand increaso at 2 (6,3%) patients. Among the patients of control group pain dissapeared at 4 (13,3%) patients, reduced at 15 (50,0%) patients, stayed without changes at 7 (23,4%) patients and increased at 4 (13,3%) patients. So, pain dissapeared under influence of basic type of treatment 1,6 times more often and reduced 1,3 times more often than under influence of only traditional therapy of chronic pancreatitis. At the same time, pain stayed the same among the patientof main group 3,7 times and increased 2,1 times rarely, than at patients of control group.

Manifestations of dyspepsia dissapeared at 6 (18,8%), reduced at 19 (59,4%), stayed the same of 5(15,6%) and increased at 2 (6,2%) patients of main group. Respective characteristics among the patients of control group were 4 (13,3%), 14 (46,7%), 8 (26,7%) and 4 (13,3%). So, adding of Dialipon to the complex therapy of LDS was more effective as influence to syndrom of dyspepsia.

Palpatory tenderness dissapeared or reduced at 24 (75,0%) patients of main group and at 16(53,3%) patients of control group, which is an improving of suitability of Dialipon’s using during the.treatment of LDS.

Improvement of coproscopy characteristics was similar and equally pronounced at patients of both groups. We connect such distinct and similar result during both types of therapy with the fact, that patients of both groups received basic medicines with enzymatic medicines and particularly Creon, which was the main component of both types of therapy. This insisted of practically liquidation of maldigestive syndrome at all.the patients who were detected with steatorrhea (4 patients), amylorrhea (3 patients) and kreatorrhea (4 patients).

During the analysis of dynamic of fecal pancreas elastase-1 rates it was found, that due to.results of elastase test extrasecretory pancreas function improved better under influence of treatment of patients of main group, then at patients of control group. So, if before the treatment normal rate of elastase-1 at stool was indicated at 8 (25,0%) patients of main group ang 8 (26,7%) patients of control group, after treatment these rates were 12 (37,5%) and 19 (25,0%) patients respectively. After treatment the rate of light pancreas failure was 37,5% (12 patients) at main group and 36,7% (11 patients) at control group. The rate of average pancreas failure was 18,7%

(6 patients) and 23,3% (7 patients) respectively, while the rate of sever pancreas failure stayed the same as before the treatment. Particularly, 2 patients with fecal pancreas elastase-1 characteristic lower than 100 mcg/g were added to the main group, that was 6,3% of all examined patients of that group. After treatment results of elastase test stayed low for both of them, so sever extrasecretory pancreas failure was saved. Similar situation was mentioned at the control group. There were also 2 patients with strongly pronounced pancreas failure (6,7% cases of all the patients of control group). Practically the same low results were saved at patients of this group after the treatment (fig. 2).

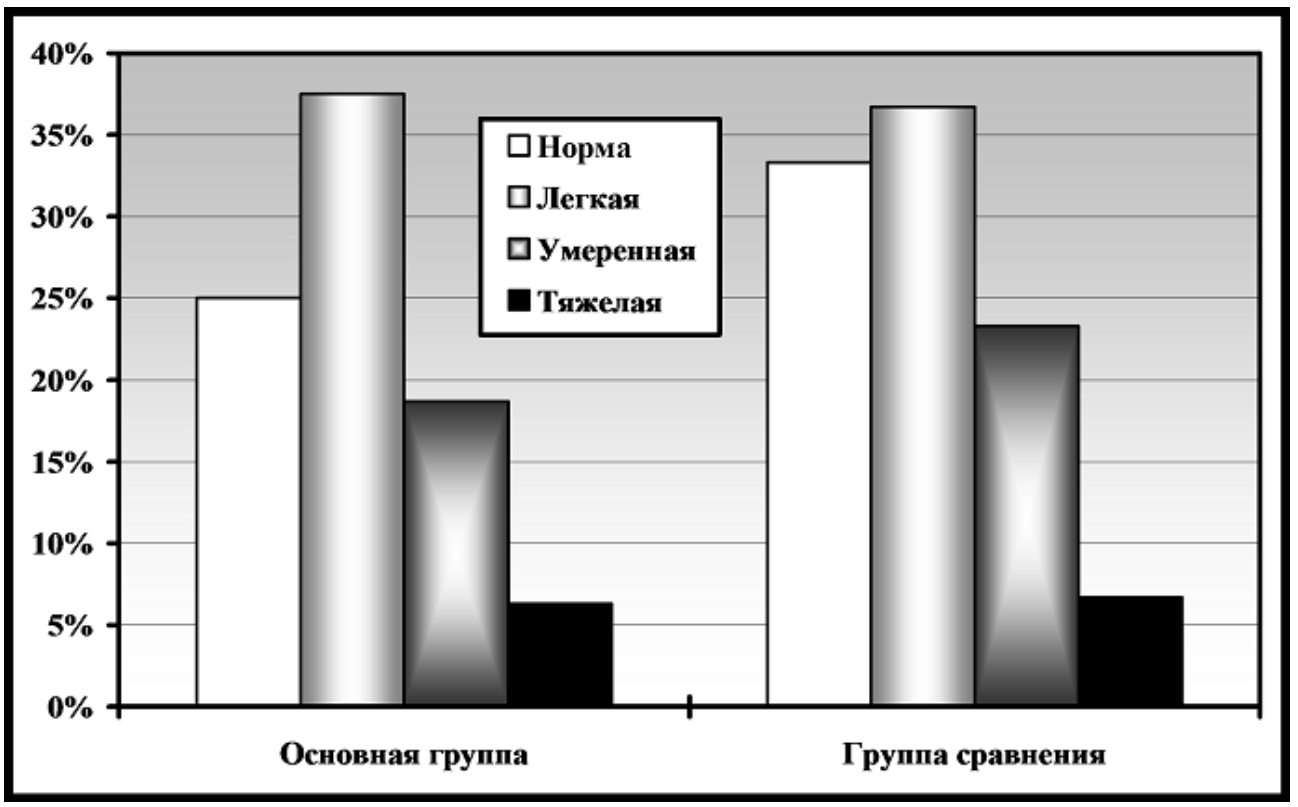

Fig. 2. The different rate of extrasecretory pancreas failure according to the results of fecal pancreas elastase-1 research after the treatment of patients in both groups

Therefore, the treatment assisted the increasing of rate of normal fecal elastase test using both types of treatment. But at the main group the rate of normal fecal pancreas elastase-1 characteristics after treatment was higher for 4,2% then at control group. Though, at first sight, difference isn’t very large, but at the main group there were up 4 patients with normal fecal elastase-1 characteristics after treatment, then before it, that’s 1,5 times more. At the control group ther were up 2 patients with

normal elastase test characteristics, so the rate of normal extrasecretory pancreas function increased only 1,2 times. After treatment the rate of light pancreas failure according to data of researching of fecal pancreas elastase-1 at main group was 37,5% (12 patients) and 36,7% (11 patients) at control group. Reducing of rate of light pancreas failure under influence of treatment happened at two groups, because of 4 patients of main group and 2 patients of control group reached the normal data of elastase test, so the rate of such normalisation at the main group was 2 times more often then at control group. Average pancreas failure occured distinctly rare after treatmenusing Dialipon — in 18,7% cases (6 patients of main group). At the control group after treatment average pancreas failure occured in 23,3% cases (7 patients). So, in the presence of originally average reducing if extrasecretory pancreas function dynamic of such function was feebly marked in comparison with dynamic of light pancreas failure. According to our data dynamic from average till light pancreas failure under influence of therapy was mentioned at 3 patients of main group and only 1 patient of control group. As the result, the rate of average reducing of external pancreas secretory after treatment among the patients of control group was 1,2 times higher, than at main one. Finally, normal characteristics of elastase test and their light reducing after treatment were discovered at 75,0% patients of main group and more rarely at 70,0% of patients of control group. The rate of average and severe pancreas failure after treatment, on the contrary, was higher at the control group — 30,0%, while at the main group — at 25,0% of patients. It should be mentioned, that according to literature data results of the research of fecal pancreas elastase-1 are very inactive, but, at list, we managed the improvement, especially at main group. We explain such favourable dynamic by effective treatment of steatopancreatitis, which assisted the improvement of functional pancreas condition.

Dynamic of the results of researching the extrasecretory panreas function by noncatheter methods under influence of treatment is represented at table 1. Patients of both groups didn’t have a representative reducing of the activity of blood and urine α-amylase, blood P-isomylase, blood lipase during the treatment, because these characteristics weren’t increased very much during admission to the hospital.

Table 1

The influence of treatment on the results of noncatheter methods of extrasecretory pancreas function research

Indexes	Main group (n=32)		Group of comparison (n=30)		Control group (n=30)
	Before treatment	After treatment	Before treatment	After treatment	
Blood α-amylase , мссат/l	2,39±0,41	1,97±0,47	4,42±0,37	2,03±0,44	1,16±0,45
Blood P-isoamylase, мссат/l	1,38±0,21	1,07±0,14	1,35±0,19	1,14±0,18	0,71±0,12
Urine α-amylase , мссат/l	6,24±0,76	5,53±0,68	6,31±0,69	5,69±0,71	5,08±0,68
Urine P-isoamylase, мссат/l	6,15±0,37	3,04±0,34*/**	6,13±0,41	4,49±0,33*	3,09±0,42
Blood lipase, Un/l	41,0±8,0	34,0±7,0	42,0±7,0	36,0±6,0	24,0±8,0

Note: * — difference between indexes before and after treatment is representative; ** — difference of indexes in both groups is representative ($p<0.05$)

Advantages of the main type of treatment were indicated for dynamic of P-isomylase activity of urine. Characteristic was considerably reduced at both groups. But, at the main group we reached the lower activity of this enzyme, then in control group.

After treatment among the patients of main group only 1 (3,1%) has increasing of head of pancreas, while there were 3 (10,0%) such patients among the control group,that’s 3,2 times bigger. After the treatment nonuniform structure of pancreas was indicated at 28 (87,4%) patients of main group and at 29 (96,7%) patients of control group.

The increasing of echogenicity of pancreas tissue has been saved after the treatment at all the patients, who had that symptom during the admission to the hospital. Reducing of echogenicity of pancreas after currying out the treatment was

indicated at 2 (6,2%) patients of main group and at 3 (10,0%) patients of control group. Normal echogenicity of pancreas has become indicated more often, than before treatment and at the main group after carrying out the therapy this sign had been at 5(15,6%) patients of main group and at 4 (13,3%) patients at control group. Unsharp contours of pancreas and their unevenness were indicated at 17 (53,1%) and 18(56,3%) patients of main group respectively. At the control group these symptoms were indicated more often after the treatment: 19 (63,3%) and 21 (70,0%) patients respectively.

Calcified focuces and calcifications of pancreas, its pseudocysts, dilatation of Wirssung's duct were saved after the treatment at patients, who already have it during the admission to the hospital. The rate of these sonografic symptoms was distributed evenly among the patients of both groups.

During the analysis of characteristicsof ultrasonic gystography of pancreas it was discovered, that L-indexes was representively lower after treatment at main group — 19,8+/-0,6. At control groupnthe dynamic of L-index wasn't representative. We assume that the considerable dynamic of L-index at the main group is very important, because the original increasing of this index was evidence of the excess quantity of lipid at pancreas tissue. Index N was increased representively at both groups and there was no important difference between the results of treatment according to the type of therapy. K_{gst} is considerably increased at patients of both groups, but considerable difference between this index after treatment was managed according to adding or not adding Dialipon to the therapy. At the main group K_{gst} after the treatment was 98,6+/-5,9, and at the control group -69,2+/-5,3($p<0,05$). L-index at the area of right liver lobe was considerably reduced at the patients of main group till 23,4+/-1,1($p<0,05$), and at the patients of control group it practically hasn't been changed (25,7+/-0,7). We consider such results of liver gystography as the reducing of lipid quantity in it under the influence of treatment by Dialipon, while there is no considerable dynamic at this question during the prescription of basic therapy only.

The treatment of patients of main group had advantages not only in correction of functional pancreas condition, but in correction of functional liver condition as well. Representative reducing of ALT, AST was managed under influence of both types of treatment. But the considerable reducing of GGTP characteristics was indicated only at patients of main group (table 2). Activity of blood AP hasn't been changed representively at patients of both groups. Perhaps, it is explained by saving the cholestasis as the result of papillostenosis, which is one of the often components of LDS in the presence of biliary sludge at gall bladder. At the same time, indexes of whole and conjugated bilirubine of blood came back to their normal rates under the influence of both types of treatment, level of whole blood protein was normal. Indexes of albumins and γ-globulins in blood were improved representively only at the patients of main group (table 2). In patients, who took Dialipon as anaddon to the basic therapy, after the treatment the representative reducing of whole lipids, whole cholesterin, triglycerides, average- density lipoproteins, low-dencity lipoproteins in blood and the considerable increasing of a-cholesterin's level in blood was noticed in comparison with first examination. The only index of lipidogramm, which hasn'tbeen changed representively at the patients of main group is the index of high-density lipoproteins, though there was small tendention to increase. Index of atherogenity at the main group reduced considerably under the influence of therapy.

Table 2

Dynamic of functional liver condition at the examined patients under the influence of treatment

Indexes	Main group (n=32)		Group of comparison (n=30)	
	Before treatment	After treatment	Before treatment	After treatment
Total protein, g/l	58,2±4,9	62,6±6,4	57,4±5,2	61,3±5,8

Albumins, %	46,1±1,5	53,1±1,6*	47,5±1,3	49,6±2,1
Globulins, %:				
α_1	2,4±0,6	2,6±0,3	2,2±0,5	2,4±0,6
α_2	7,5±0,5	8,1±0,6	6,9±0,6	7,5±0,4
β	12,1±1,4	14,3±1,6	12,3±1,1	13,6±1,8
γ	31,8±1,3	22,9±1,7*	31,4±1,9	27,1±1,4
Total bilirubin, μmol/l	31,2±2,2	16,8±2,7*	30,4±2,8	19,4±2,3*
Conjugated bilirubin, μmol/l	7,4±0,2	3,1±0,4*	7,3±0,4	3,6±0,3*
ALT, Un/l	82,7±2,4	38,3±2,7*	81,2±2,7	41,4±2,3*
AST, Un/l	78,4±2,3	34,2±2,6*	75,8±2,9	36,5±2,8*
AP, Un/l	273,7±8,4	244,6±8,1	265,1±9,7	247,2±7,4
GGTP, Un/l	82,3±3,9	58,3±3,7*	82,9±3,5	70,5±2,9

Note: * — difference between indexes before and after treatment is representative

At the control group the representive dynamic was managed only in increasing of α-cholesterin's level in blood (table 3). It should be mentioned though, that the patients followed the diet, didn't drink the alcohol. So, the basic therapy isn't effective enough in influence on lipid blood spectrum.

Table 3

Influence results of treatment on lipid blood profile at the examined patients

Indexes	Main group (n=32)	Group of comparison (n=30)

	Before treatment	After treatment	Before treatment	After treatment
Total lipids, g/l	9,7±0,7	6,1±0,7*	9,6±1,1	7,8±0,5
Total cholesterin, mmol/l	11,8±1,1	5,3±1,4*	12,4±1,2	8,4±1,7
Triglycerides, mmol/l	2,87±0,17	1,68±0,23*	2,81±0,28	2,47±0,19
α-cholesterin, mmol/l	1,06±0,13	1,76±0,11*	1,09±0,09	1,71±0,07*
MDLP, %	54,9±1,3	47,6±1,5*	53,2±1,1	49,4±1,6
LDLP, %	33,9±1,4	27,1±1,3*	34,2±1,3	32,6±1,6
HDLP, %	16,4±0,9	20,3±1,7	16,1±0,7	18,3±1,9
Atherogenic index	7,45±0,63	4,35±0,74*	7,41±0,82	7,08±0,69

Note: * — difference between indexes before and after treatment is representative

Conclusion. The treatment of LDS qith Dialipon has considerable advantages in comparison with generally accepted therapy concerning the influence to clinical manifestations of combined pathology, to functional condition and structure alterations of pancreas, liver, lipid profile of blood.

Effectiveness of lipoic acid in the treatment of lipid distress syndrome

N. B. Gubergrits, N. V. Byelyayeva

Donetsk National Medical University n. a. M. Gorky, Ukraine

Key words: lipid distress syndrome, non-alcoholic fatty liver and pancreas disease, dislipoproteinemia, target organs, Dialipon

Current understanding of lipid distress syndrome, its pathogenesis, target organs are described in the article. Therapeutic potential of the lipoic acid preparation Dialipon is also analyzed. The authors presented the results of their own research on the effectiveness of Dialipon in patients with lipid distress syndrome, which included non-alcoholic steatohepatitis, steatopancreatitis, atherosclerosis, obesity.