

## Optimization of traditional technologies of restorative therapy for lobular panniculitis

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### SUMMARY

Panniculitis (Mon) Is a group of heterogeneous inflammatory diseases, characterized by damage to the subcutaneous fatty tissue, the musculoskeletal system and internal organs. The variety of their forms and variants of the course requires a thorough examination of the patient in order to verify the diagnosis. Mon treatment is not developed and is carried out, as a rule, empirically and is not always effective. Therefore, the issue of widespread inclusion of restorative medicine methods in the treatment regimen of the underlying disease is becoming increasingly important. The article presents the first description of the use of pharmacopuncture with homotoxicological drugs and ultrasonic shock wave therapy in 23 patients with lipodermatosclerosis.

Key words: panniculitis, lipodermatosclerosis, pharmacopuncture, ultrasound shock wave therapy.

### RESUME

Panniculitis (Pn) - is a group of heterogenic inflammatory diseases, which is characterized by affection of subcutaneous adipose tissue, locomotor apparatus and internal organs. Variety of forms and diversity of course requires detailed examination for verification of diagnosis. Therapy of Pn is not regulated, when realized empirically is not always effective. This determines high actuality for inclusion of rehabilitation medicine methods in the treatment of disease. The first description of homotoxicologic pharmacopuncture and ultrasound shockwave therapy of 23 patients with lipodermatosclerosis is given.

Keywords: panniculitis, lipodermatosclerosis, pharmacopuncture, ultrasound shockwave therapy.

Diagnosis of panniculitis (PN) is associated with significant difficulties due to a variety of etiological factors, which leads to overdiagnosis and inadequate therapy.

The frequency of Mon in different regions of the world varies widely and depends on the prevalence of a particular disease, which is the etiological factor of the pathology in question in a given area [1, 2].

Today there is no single generally accepted classification of Mon. A number of authors have proposed to group Mon depending on the etiology and histomorphological picture. In accordance with the predominance of inflammatory changes in the connective tissue septa (septa) or fatty lobules, septal and lobular panniculitis (LPN) are isolated. Both types of PN can occur with or without signs of vasculitis, which is reflected in the clinical picture of the disease [1-3].

A typical representative of LP is lipodermatosclerosis (LDS) - degenerative-dystrophic changes in subcutaneous adipose tissue (SFA) that occur in middle-aged women against the background of chronic venous insufficiency (CVI) [1, 3]. It is believed that the prevalence of complicated odds

CVI (including LDS) is a criterion for the quality of medical care in a particular country. The incidence of edematous syndrome and trophic disorders (hyperpigmentation, LDS, eczema) varies from 3 to 11% [4]. Their development, as a rule, is due to inadequate treatment or the absence of it, which is often associated with late treatment of the patient for medical

help.

Traditionally, it was believed that CVI pathogenesis is based on valvular insufficiency of various parts of the venous bed of the lower extremities, leading to the appearance of pathological, retrograde blood flow, which is the main factor in damage to the microvasculature. However, a large number of patients were identified with complaints characteristic of CVI in the absence of valve pathology [4, 5]. Thanks to the use of plethysmography, it was hypothesized that CVI is not a disease of the valve apparatus, but a pathology of the vein wall.

It has been proven that in the presence of various risk factors (genetically determined defects of connective tissue, changes in hormonal levels, prolonged static loads, overheating, insufficient physical activity, etc.) and under the influence of gravity in the venous knee of the capillary, the pressure increases, which reduces the arteriovenular gradient required for normal perfusion of the microvasculature. The consequence of these processes is, at first, periodic, and then constant tissue hypoxia. Disruption of the normal intercellular relationships of the venous capillary endothelium leads to the activation of genes encoding the synthesis of various adhesion molecules. Such a process with elements of aseptic inflammation captures all new parts of the venous bed of the lower extremities and even acquires a generalized character.

LDS is characterized by an acute onset with the development of painful hyperemic seals on the skin of the lower third of the leg, more often on the medial surface. With the progression of sclerosis and atrophy of the PZhK and the transition of the process to the chronic stage, hyperpigmentation, induration of the skin up to the formation of a woody density with a clear demarcation line is noted in the lesion. This leads to a characteristic glass-like deformation of the lower third of the lower leg. Later, in the absence of treatment for venous pathology, trophic ulcers are formed [4, 7-9].

However, the treatment of LDS is not standardized and is carried out mainly empirically. Classical methods of therapy, mainly drug therapy, are far from always effective. Therefore, the issue of widespread inclusion of restorative medicine methods in the treatment regimen of the underlying disease is becoming increasingly important, the principle of which is a polysystemic effect on the body due to the activation of adaptive-compensatory reactions, while eliminating the risk of unwanted side effects [10]. This principle is the essence of restorative medicine, in the arsenal of which there are various non-drug methods of treatment and prevention, including the possibilities of traditional medicine, in particular, pharmacopuncture (FP) and ultrasonic shock wave therapy (UUT). In the literature, there are isolated studies of physiotherapy at Mon [11-15]. The first report on the promising use of this type of treatment for this pathology belongs to Faint J. [11]. Later, other authors showed a positive effect on LDS of ultrasound [12], laser therapy [13], pharmacopuncture of glatiramer acetate [14] and hirudotherapy [15]. The work on the complex use of ultrasound therapy and mesotherapeutic administration of homotoxicological drugs in the treatment of patients with edematous-fibrosclerotic panniculitopathy [16] seems to be projection. At the same time, cases of PN development during induced electroacupuncture [17] and massage [18] have been described. The work on the complex use of ultrasound therapy and mesotherapeutic administration of homotoxicological drugs in the treatment of patients with edematous-fibrosclerotic panniculitopathy [16] seems to be projection. At the same time, cases of PN development during induced electroacupuncture [17] and massage [18] have been described. The work on the complex use of ultrasound therapy and mesotherapeutic administration of homotoxicological drugs in the treatment of patients with edematous-fibrosclerotic panniculitopathy [16] seems to be projection. At the same time, cases of PN development during induced electroacupuncture [17] and massage [18] have been described.

In this regard, it is very promising to study and evaluate the effectiveness of the clinical application of the most pathogenetically substantiated pharmacopuncture methods with homeopathic preparations and UUT as part of a complex conservative treatment of LDS.

#### MATERIALS AND METHODS

The study involved 467 patients who applied to the N.I. V.A. Nasonova with referral diagnoses of "erythema nodosum" or "panniculitis" in 9.9% (46) patients (women - 44, men - 2) aged 18 to 80 years with increased body weight (32)

LDS was verified with a disease duration of  $11.8 \pm 6.4$  months. The duration of the last exacerbation was different, but cases with a duration of 5 to 8 months prevailed. A family history of chronic venous insufficiency was aggravated in 27 people (59%), and in the relatives of 7 (15.2%) patients, indurations were also localized on the shins.

In accordance with this goal, the patients were randomized into two comparable groups of 23 people each. All patients took non-steroidal anti-inflammatory drugs, aminiquinoline and angioprotective drugs orally. Patients of the 1st group, against the background of conventional therapy, underwent daily FP with homeopathic preparations possessing antioxidant (AO), anti-inflammatory (PVP), lymphatic drainage and lipolytic actions (manufactured by HEEL, Germany) 8.0 ml No. 10 and UUHT with a frequency of 3 MHz No. 5 on the sealing area. II gr. - the group (comparison group), in addition to the basic treatment, received FP with saline sodium chloride 0.9% - 8.0 ml without USHT. The course of treatment in all groups consisted of 10 procedures with a frequency of 5 times a week of AF and twice a week of USWT in the first group.

The main stages of control: initially (T0), after 14 days (T1), 1 (T2) and 3 months. (T3).

Pharmacopuncture consisted of subcutaneous or intradermal injection of the drug into the area of projection of acupuncture points (TA), according to the general principles of acupuncture treatment. Used TA E 36, RP 6, VB 34 and local points in the affected area of the skin and SFA.

UUHT was performed on a Vip Line Duo apparatus using combined exposure to ultrasound at a frequency of 1-3 MHz. During one procedure of ultrasonic cavitation, the affected area was treated, the area of which does not exceed 25 cm. The exposure time was 10 minutes. The next step is exposure to ultrasound. Pressing the nozzle firmly against the skin, preventing the appearance of an air gap between the nozzle and the body, moving the nozzle in slow circular movements (clockwise). Duration - 10 minutes.

The inclusion criteria were: patients aged 18–80 years, the duration of the disease or relapse no more than 2 years, the patient's written consent to participate in this study.

Exclusion criteria: severe dysfunctions of the cardiovascular system, liver, kidneys, pregnancy and lack of written consent for the participation of the patient in the observation of this study.

All patients underwent a comprehensive examination:

1. Clinical: collecting anamnesis, which paid attention to chronic diseases, allergic and drug status, hereditary factor, frequent travel, etc.; as well as a detailed study of the lesions of the musculoskeletal system, respiratory, cardiovascular and other systems.

2. To verify skin lesions, we proposed to estimate the prevalence, color and number of affected areas. The intensity of pain on palpation of the node was determined using a visual analogue scale (VAS) when pressing on the center of the node until the researcher's nail phalanx was whitened.

3. To assess blood circulation in the affected limb and the nature of the change the functional state of the muscle-venous pump of the lower leg, the circumference of the middle third of the lower leg was measured with a centimeter tape.

4. Laboratory and instrumental research included: general analysis of blood and urine; biochemical (lipid profile, amylase, ferritin,  $\alpha$ -1-antitrypsin, calcium, glucose, liver parameters, creatine phosphokinase) and immunological (C-reactive protein (CRP), rheumatoid factor (RF), antibodies to double-stranded DNA (ds- DNA), antinuclear antibodies (ANP-Hep2), antineutrophil cytoplasmic antibodies (ANCA-p and -c), antibodies against nuclear antigens (anti-Ro / La), antistreptolysin O (ASL-O), antibodies to hepatitis B / C viruses, HIV, RW, antibodies to Yersinia, etc.) studies, intradermal tuberculin test and instrumental methods (electrocardiography, echocardiography, computed tomography of the chest, ultrasound examination of internal organs).

5. The study of the pathology of the vascular bed of the lower extremities was carried out

### megodum ultrasound dopplerography (USDG)

with registration of the linear blood flow velocity in the veins concerned (femoral, popliteal, hind tibial, feet) using the SAL-50A device from Toshiba (Japan) with the SDL-01 Doppler attachment

6. The severity of the inflammatory process in the PZhK of the legs was estimated according to the data ultrasonography, which was performed on a Voluson 730 Expert apparatus with a linear multifrequency transducer with a frequency of 10-16 MHz with elastography (USE), which allows to determine the depth and prevalence of the inflammatory process.

The effectiveness of the impact was determined according to standard criteria, highlighting the positions of "significant improvement", "improvement", "no effect", "deterioration".

The data obtained were processed using the Statgraphiks statistical software package developed by BSC JNS (USA). At the same time, the digital material was processed in accordance with the basics of variation statistics according to the Student's method.

## RESULTS

At the first stage of the work, the features of the LDS flow were clarified. So in 16 cases (36%) the acute course of the disease was verified, which was characterized by the appearance of pink painful seals without clear boundaries. In 30 cases (64%) - chronic, with bluish-brown skin and a "glass" symptom. In 66%, the medial surface was affected, in 24% - the anterior and 10% of the medial-anterior surface of the lower third of the legs. In 90% of cases, the process was asymmetric. The size of the nodes was  $9.5 \pm 4$  cm, with moderate pain (VAS pain =  $42 \pm 15$  mm) and up to 2 seals in 85% of patients. The volume of the middle third of the affected tibia was  $44.7 \pm 5.6$  cm compared to the other without pathology of the lower leg  $40.3 \pm 4.4$  cm ( $p = 0.003$ ,  $r = 0.26$ ). In 21 (46%) patients, skin lesions were associated with polyarthralgias (15), myalgias (12), accelerated ESR (8) and increased CRP titer (8). 67% of patients had CVI with a disease duration of  $10.2 \pm 1.3$  years, confirmed by USDG of the lower extremities ( $p < 0.05$  in relation to the "norm"). During parallel Doppler sonography, significant ( $p < 0.05$ ) circulatory disorders were observed in the trunk and branches of the great saphenous vein in 62% of patients and in the lesser saphenous vein in 5%. Both veins were involved in the pathological process in 7% of cases, which is consistent with the results of other authors [4-9]. Ultrasound of the node in all cases showed a thickening of the PZhK in the form of "lumps" with macrovascularization. 05), circulatory disorders were observed in the trunk and branches of the great saphenous vein in 62% of patients and in the small saphenous vein in 5%. Both veins were involved in the pathological process in 7% of cases, which is consistent with the results of other authors [4-9]. Ultrasound of the node in all cases showed a thickening of the PZhK in the form of "lumps" with macrovascularization. 05), circulatory disorders were observed in the trunk and branches of the great saphenous vein in 62% of patients and in the small saphenous vein in 5%. Both veins were involved in the pathological process in 7% of cases, which is consistent with the results of other authors [4-9]. Ultrasound of the node in all cases showed a thickening of the PZhK in the form of "lumps" with macrovascularization.

The results obtained at this stage of the work made it possible to move on to solving the main issue - optimization of technologies for the rehabilitation treatment of patients with LDS. In the first treatment group, the basic drug was administered subcutaneously in combination with USWT. In group 2, pharmacopuncture was performed with physiological saline.

As a result, after a course of physiotherapy (T1), a significant positive dynamics was noted in group I compared with group II for: leg circumference, size (Fig. 1, 2) and the severity of the color of the seal ( $p = 0.044$ ;  $r = 0.17$ ). We studied the analgesic effect of the applied methods of treatment, which revealed a statistically significant difference between the groups (Fig. 3) ( $p = 0.0015$ ,  $r = 0.27$ ). As can be seen from the data in Fig. 3, the VAS coefficient of pain in group I statistically significantly decreased to T1 and, especially, to T2 ( $p = 0.044$ ;  $r = 0.17$ ). Subjective indicators of a decrease in disease activity were correlated with a decrease in ESR and CRP, changes in the lipid profile were not detected, however, statistically significant results were not obtained.

Undoubtedly, the use of ultrasound examination of the skin and PZhK seems to be promising in the examination of such patients, as a method of diagnosis and evaluation of therapy. The most important advantages of this method are non-invasiveness, painlessness, the possibility of repeated use for monitoring the course of the disease and assessing the effectiveness of treatment, as well as documenting all the features with subsequent comparative analysis. This objective screening method of diagnostics confirmed a positive effect on the thickening of the pancreas in the form of "lumpiness" with macrovascularization ( $p = 0.011$ ;  $r = 0.23$ ). Doppler ultrasound data did not reveal significant clinical signs of improvement, which is probably due to the methodological approach

this survey.

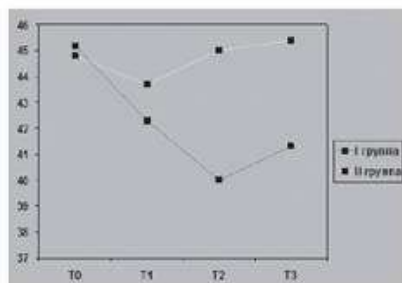
Based on the determination of the reliable interval for the difference in relative frequencies, it was found that the symptom of the "glass" [-0.08; 0.14] and the number of seals [-0.06; 0.14], had no differences before treatment and after therapy for the entire observation period in patients of I and II observation groups. That is, neither restorative therapy nor placebo therapy had a significant effect on these indicators.

Homeopathic antioxidant preparations (firm "HEEL", Germany) used for FT were well tolerated, no side effects were found.

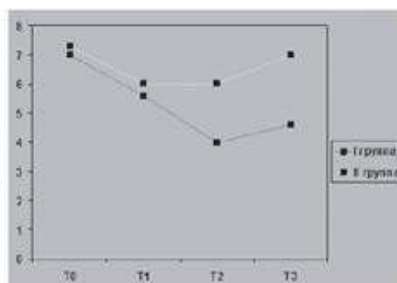
As can be seen from the data presented, positive clinical dynamics of the skin and SFA was observed at all stages of observation, with the maximum regression of statistical and dynamic indicators to T2. Thus, the therapeutic effect increased in 74% of cases in group I ( $p = 0.044$ ,  $r = 0.17$ ), while in group II only in 30% of cases ( $p = 0.03$ ;  $r = 0.26$ ) (Fig. . 1-3). The results obtained were comparable with the USE data in 20 patients and in 9 with USP.

After 2 months. after therapy (T3), 31 patients showed an increase in the clinical manifestations of LDS, mainly in group II (23) ( $p = 0.00004$ ;  $r = 0.35$ ) (Fig. 1-3).

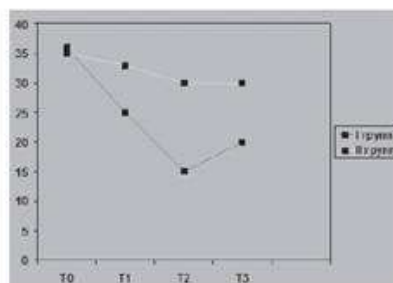
As a result of the clinical efficacy of the compared treatment options, the advantage of the complex combining AF and USWT in the first group was established. Thus, a significant improvement (a clear regression of subjective and objective characteristics) and improvement (a decrease in only subjective manifestations) amounted to 91.2% in group I versus 30.3% in group II ( $p = 0.005$ ,  $r = 0.25$ ) (Table 1) ... The lack of effect and worsening of the condition were noted in 69.4% of patients in group II compared to 8.6% in group I ( $p = 0.044$ ;  $r = 0.26$ ).



**Рис. 1.** Динамики окружности (см) в средней трети пораженной голени в исследуемых группа на фоне терапии (n = 46).



**Рис. 2.** Динамики размера (см) уплотнения в исследуемых группа на фоне терапии (n = 46).



**Рис. 3.** Динамики ВАШ боли (мм) в исследуемых группа на фоне терапии (n = 46).

Table 1

Effectiveness of methods of influence (n = 46)

Группы	Значительное улучшение		Улучшение		Без эффекта		Ухудшение	
	Абс.	%	Абс.	%	Абс.	%	Абс.	%
I (n = 23)	17	73,9	4	17,3	2	8,6	—	—
II (n = 23)	2	8,6	5	21,7	14	60,8	2	8,6

## DISCUSSION

All over the world, evidence-based restorative therapy is considered an increasingly important and progressively developing section of prevention and treatment of various nosological forms of the disease [10-16]. This fact is the rationale for the need to develop innovative strategies for a physiotherapeutic approach in pathology such as panniculitis. Our monitoring analysis of this method of treatment revealed the evidence-based validity of the use of FT and USWT in LDS.

As a result of the study, we have established a time interval for evaluating the effectiveness (14-30th day of therapy), adopted taking into account the regression of clinical manifestations of LDS,

which cannot be docked within 5-10 days.

Analysis of the dynamics of clinical and instrumental data testifies to the therapeutic efficacy of combined FT and USWT. FT had a significant lipolytic effect on the VFA, which confirmed a decrease in the diameter of the middle third of the affected tibia and did not lead to a deterioration in the lipid spectrum. Performing multiple injections did not cause increased aggregation, coagulation, and the development of new foci of the inflammatory response of the PFA. Similar results were obtained by other authors [16]. FT probably had a regulatory effect on the tone of arterioles and the associated level of basal blood flow and, as a consequence, a change in color and a decrease in the size of the seal, confirmed by ultrasound. Similar effects were noted with USWT, but this method also reduced intravascular resistance and signs of venous congestion, which, possibly,

When comparing the results of treatment between groups I and II of patients, statistically significant differences were found for all studied clinical manifestations, with the exception of the "glass" symptom and the number of lumps.

The results of the analysis of the dynamics of the pain syndrome in patients of the first group of observation indicate that the inclusion of AF and UUHT in the complex therapy contributes to a pronounced analgesic and regenerative effect on the skin and the SSS in comparison with the second group.

#### CONCLUSION

The problem of rehabilitation of patients with LDS is largely determined by the peculiarities of vascular reactions, implemented at the level of various systems of the whole organism and aimed at arresting the emerging morphological and functional disorders. Based on our experience, we have developed ways to optimize rehabilitation measures for treating patients with this pathology. To this end, we have improved and standardized methods such as pharmacopuncture with homotoxicological drugs and ultrasound shock wave therapy. In the course of the study, the high therapeutic efficacy of these rehabilitation methods was established, which was confirmed by the regression of skin symptoms and a pronounced analgesic effect.

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