

EXPERIMENT OF USING DENAS APPARATUSES IN COMPLEX TREATMENT OF OSTEOARTHRITIS DEFORMANS

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Osteoarthritis deformans (OAD) is a dystrophic disease in joints caused by affection of the articular cartilage. Disease occurrence gradually increases as people grow older and reaches its maximum at 60-65 years of age. Usually primary (idiopathic) and secondary OAD are distinguished. OAD is called primary (idiopathic) when it was not possible to find an immediate cause of its occurrence. Secondary OAD is a consequence of different diseases, traumas and maldevelopment of the musculoskeletal system. At that, large joints of lower extremities (knee- and hip joints) are mainly affected as well as first metatarsophalangeal articulations. Several causes or risk factors of disease development can often be found in patients with osteoarthritis. Selection of treatment methods depends on the stage and period of the disease. During acute conditions of the disease a complex of measures is applied aimed at liquidation of the pain syndrome, improvement of the tissues trophism and blood circulation in the affected extremity, increase of the joint stability.

At early stages when the articular cartilage is not affected and with absence of contraindications, the so-called chondro-protective drug therapy is indicated. Therapeutic effect of these preparations in OAD treatment is associated with a favorable influence on the malfunctioning metabolism of the articular cartilage which slows the process progressing down. A clinically pronounced effect of these preparations is achieved only under conditions of their regular and long application.

Non-efficiency or short-term effect of repeated course of conservative treatment under progressive disease is an indication for surgical treatment of OAD. Basic criteria of the before-operational treatment to be considered inefficient are the following: continuous pains, increase of deformations and joint instability, restriction of joint movement. Modern methods of OAD surgical treatment are aimed at correction of existing biomechanical disorders. Under osteoarthritis of hip and knee-joints a good clinical result with a positive roentgenological dynamics can be achieved with the help of extraarticular correcting osteotomies. Their efficiency can be explained by influence on the basic links of the pathological process, improvement of centering of the mechanical axis of the extremity, joint congruence and stability, increase of the contact surface of the articulated joint surfaces, influence on active muscular components of joint stabilization, and positive influence on the local microcirculation.

Unfortunately, factors resulting in the beginning and progressing of OAD usually fail to be eliminated. Nevertheless, doctors should aim at their detection and correction. According to some sources a good clinical effect in patients with OAD was achieved when applying dynamic electroneurostimulation (DENS) in complex treatment. This method enables one to achieve a high efficiency and, at the same time, is an easy application. During DENS application, exposure is on biologically active zones and points with short current impulses of low frequency, which change their form in response to a change of the skin electrical resistance in the subelectrode area.

During DENS procedure, optimization of function of anti-nociceptive and trophic processes in the pathologically changed tissues and organs is achieved due to local, segmental-reflex and general reactions. This provides for analgetic, anti-inflammatory, anti-edema and tropho-stimulating effects. Thus, DENS application for treating arthritis deformans is well-grounded theoretically.

Purpose of the present research was to assess DENS efficiency and its influence on dynamics of clinical and laboratory indexes of patients with acute OAD of joints of extremities in the polyclinics conditions.

Materials and methods.

31 patients with osteoarthritis deformed knee- and hip joints of I-II degree were examined. Patients were divided into groups by the method of random nonrepeated sampling. The patients were divided into two groups (main group - 19 people, and control group - 12 people). Average age of patients of the main group was 53.3 years (from 30 to 78 years), of the control group - 57.4 years (from 24 to 80 years). Average duration of the disease in the main group was 5.53 ± 2.6 years, in the control group - 2.75 ± 5.75 years (from one to 10 years). All patients had an X-ray examination of joints. Before treatment patients of both groups had pain syndrome (100 %), edema of the affected joints (32.2 %), restriction of joints movement (100 %), reduction of the muscle strength (100 %). Dynamics of clinical symptomatology was assessed on the 5th and 15th days from the beginning of the treatment course. No significant differences by age, gender, degree of process activity and duration of the disease in the compared groups were present. Patients of the main and control groups had similar drug therapy; in addition, patients of the main group had dynamics electroneurostimulation (DENS).

DENS was applied in compliance with the recommended procedures. Individual treatment recipe was selected for each patient at each treatment procedure. Zones were selected in accordance with the current clinical presentation. Skin surface over the affected joint was treated in the THERAPY mode at the maximum power level. Dynamics of the pain syndrome was the criteria of sufficiency of exposure in the said zone. Treatment was complete when the pronounced analgetic effect was achieved (total relief or considerable reduction of pain). After that, the skin area symmetrical to the affected joint was treated in the TEST mode at the comfortable power level. The procedure was finished with treatment of universal zones; the trigger zones found, they were treated in the THERAPY mode at the comfortable power level (on average 3-5 minutes per each zone). Course apparatus treatment was finished after total regress of the pain syndrome.

Mathematical treatment of the research materials was carried out by methods of variation statistics with application of the Microsoft Excel and Biostat software package. Significant differences were assessed by the Student's criterion.

Results of the research and discussion.

In the main and control groups, dynamics of the following marker indexes for control of treatment efficiency were assessed: disorder (restriction) of affected joints movements, change of the muscular tone, pain syndrome, and clinical analyses. Before the treatment course, 4 (21 %) of 19 patients of the main group had complaints of pain in the affected joints under loads. The rest of the group had a continuous pain syndrome. 4 patients (33.3 %) in the control group had a pain syndrome under loads and 8 had a continuous pain syndrome. In the main group, a significant positive dynamic was observed starting from the 3rd-4th day of the beginning of treatment. Total relief of the pain syndrome was observed in all patients who had DENS by the 6th day from the treatment beginning (5.21 ± 0.77). Similar results in patients of the control group were achieved only by the 25th day of the therapy course (19.25 ± 6.92). Other clinical symptoms had similar regress.

Significant differences in patients of the main group were observed when assessing the muscle strength and mobility disorders in the joint on the 5th day. In the control group, significant differences showed up only on the 15th day from the treatment beginning (Table 1).

Table 1.
Dynamics of Marker Clinical Indexes in Patients who had DENS-therapy and in the Control Group

Indexes	Main Group (DENS) n=19			Control Group n=12		
	Before treatment $\chi \pm \delta$	5th day $\chi \pm \delta$	15th day $\chi \pm \delta$	Before treatment $\chi \pm \delta$	5th day $\chi \pm \delta$	15th day $\chi \pm \delta$
Restriction of joint movement, degrees	10.84±6.47	5.79±7.12	5.0±5.8	11.25±13.34	10.42±13.89	4.58±8.64
Reduction of muscle power, points	1.21±0.54	0.32±0.58	0.26±0.45	1.33±0.78	1.17±0.71	0.67±0.89

No changes were registered in clinical analyses both in the main and in the control groups.

Conclusion:

With application of dynamic electroneurostimulation for patients with osteoarthritis a pronounced and fast analgetic effect was observed, regress of basic clinical symptoms was accelerated and treatment periods were reduced. Thus, we can make a conclusion that application of dynamic electroneurostimulation for patients with acute OAD of joints of the extremities is well grounded and advisable.

Taking into account chronic nature of the disease and relative simplicity of DENS methods in combination with high efficiency of the therapy, further research should be aimed at development of optimal individual strategies of application of the apparatus therapy at home depending on the stage of the disease.

Sources

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