

PHYSIOTHERAPY IN THE PHYSICAL REHABILITATION OF PATIENTS WITH SEQUELAE OF INJURIES OF THE LOWER EXTREMITIES IN ZHYTOMIR OF REHABILITATION FACILITIESZhelezniy O.D.¹, Zasik G.B.¹, Mukhin V.M.², Skliarova N.O.¹Zhytomyr State Technological University¹Lvov State University of Physical Culture²

Annotation. *Purpose:* to study the physical properties and therapeutic effect of mechanical factors in the pathogenetic treatment in traumatology. *Material:* 622 patients were studied with the consequences of injuries of the lower extremities (age 18-64 years). Observations carried out since 2005 in hospitals and medical health institutions of Zhitomir. Selected physiotherapy factors that are mainly used for the physical rehabilitation of patients in trauma. *Results:* identified the factors that were intended to eliminate the consequences of injuries of the lower extremities. Analyzed their effect in the author's method of complex rehabilitation of patients. Performed systematization selected physiotherapy factors in a table to read and understand forms. In the medical health institutions in the city of Zhytomyr investigated and established the effectiveness of the recommendations. *Conclusions:* physical factors cause the body general, non-specific and specific response to each type of impact. This allows you to selectively influence the pathogenic elements of the disease. Should strictly adhere to the indications and contraindications to the use of physiotherapy factor. It is necessary to take into account age, sex, and comorbidity.

Keywords: physical rehabilitation, physical therapy, mechanical factors, traumatology, trauma, lower limbs.

Introduction

Statistical data about traumatism in Ukraine for recent years have been witnessing about constant increase of traumas of supporting motor system (SMS) among workable population [2, 9, 21]. The problem, which has been regarded by the authors, is rather urgent because of permanent increase of patients, who require rehabilitation of damaged organs' functions, activation of joints mobility, coordination of SMS functions, increasing of muscular strength and recreation of workability [11, 15, 18]. As per statistical report in Zhytomyr region there are 6.8 cases of bone-muscular pathology per 10 thousand of population; disability is 8.1% per 10 thousand of adult people and 71% of them are traumas of SMS. Though in Zhytomyr region these data exceed indicators of Ukraine (8.1% – in Zhytomyr region and 4.6% – in Ukraine) they witness about great number of disable people in Ukraine owing to unfavorable traffic and street conditions as well as conditions of everyday life. These people require physical rehabilitation (PR) for recreation of workability. The present article is a continuation of previous works of the authors [2, 21], which are fulfilled in compliance with SRW plan of Zhytomyr state technological university.

According to researches, conducted in Zhytomyr region, there is no appropriate programs and methodic of PR for patients of workable age, who have SMS disorders, who, after hospital did not pass recreation procedures in rehabilitation centers and sanatoriums, but immediately returned home (especially in countryside) and immediately started to work, providing health permitted it. However they had no proper health related means at home and did not practice self-rehabilitation regularly or at all [3, 4]. From all quantity of the tested people only 7.8% of traumatized have idea about traumas' after effects (in case of lower limbs' traumas), about content and sense of PR. Other patients understand PR as a quick process. There are no visual aids devoted to complex PR; there is no knowledge about its components, such as physical therapy and influence of physical factors. Modern physical therapy contains in its arsenal about 80 therapeutic methods, in which different physical factors are used [4, 6, 10]. They differ by physical properties and therapeutic effect. Physical therapy as method of patho-genetic therapy, is widely used in treatment of traumas [11, 15, 17].

Purpose, tasks of the work, material and methods

- With the help of PR specialists select from 10 groups of physical therapy factors those, which are used most frequently in traumatic treatment [5,10,12,14] ;
- Systemize the selected factors in tables of visual and informative character for further their usage in certain cases of physical rehabilitation (PR) of patients, who have lower limbs' traumas [1, 8, 21] ;
- Prove efficiency of authors' methods by results of PR of 622 patients in Zhytomyr rehabilitation centers [6, 16, 19].

For this purpose we solved the following tasks:

- Analysis of literature sources' data about mechanical factors of physical therapy, about their classifications;
- Analysis of indications and counter-indications for using of these factors in PR of patients with lower limbs' traumas;
- Provisioning of descriptive form of recommendations;
- Researching of compliance of table data with practical application of PR in therapeutic-rehabilitation centers of Zhytomyr. Results of the researches have been recommended for wide usage in medical-rehabilitation institutions.

Results of the researches

The authors tested patients, who were rehabilitated in medical and rehabilitation-sanatorium institutions of Zhytomyr, in particular, in regional rehabilitation vertebrologic center and sanatorium-rehabilitation center "Denyshi". Contingent included: sportsmen of different age categories - 6.7% and other patients.

The conducted research showed that in Zhytomyr region patients with SMS disorders make 19.1% of disabled and heavy forms of disablement (1st and 2nd groups) are observed exactly with SMS traumas (up to 50%). Often disablement is caused by traumas of SMS and periphery nervous system because for them long period of disease is characteristic as well as functional disorders of locomotion and nervous system [2, 11, 20].

Demand of patients with SMS traumatic after effects in poly-clinical rehabilitation treatment in Zhytomyr (city) is 4.1 times higher than possibility to actually satisfy it. In Zhytomyr poly clinical institutions there are no such researches; in statistic reports on health protection in Zhytomyr there are no data about it.

Increasing of patients to be rehabilitated is conditioned also by increasing of PR possibilities [1, 2, 4, 6]. For example, in Zhytomyr there is a lot of massage centers, though other methods of physical therapy are used more seldom. Analysis of patients' medical histories showed that PT (in complex of PR in after treatment period was prescribed to 483 patients or 66%, while it was practically used by only 20.3%. With physical therapy apparatuses being available at center, patients did not receive required treatment owing to absence of PR complex methodic for after effects of lower limbs' traumas.

The worked out by the authors PR methodic, in general, ensured achieving of positive results at the account of complex usage of different PR variants and their combinations with other physical therapeutic procedure, including non-traditional, for patients with after effects of lower limbs' traumas [6, 7, 13].

In hospitals, rehabilitation sanatorium centers the authors tested 622 patients (417 city-residents and 205 from countryside) who had after effects of lower limbs' traumas: fractures of different character – 368 cases, joint traumas – 96 cases, heavy open fractures – 41 cases, wounds – 52 cases, dislocations – 21, damage of Achilles tendon – 23. In hospital (immobilizing period) we tested 223 patients (53 – city residents and 170 – from countryside); in post immobilizing period - 196 and 34 accordingly; in recreational period we tested 119 patients..

It was nearly impossible to examine recreational period of countryside patients, because there is no rehabilitation specialists in countryside. The authors could to examine only 38 patients, who were rehabilitated in sanatorium "Denyshi" and 19 patients in regional rehabilitation vertebrologic center.

Patients were prescribed to be treated with physical therapeutic methods in first days of immobilizing period. Only 9 patients violated regiment of treatment in hospital period that is why they were excluded from further researches. All other followed strictly doctor's recommendations. Owing to different circumstances, subjective or objective, in average there were fulfilled 86% of procedures from the required quantity.

It was more difficult to test fulfillment of rehabilitation prescriptions in other period: city residents followed strictly all terms, countryside patients – only when it was possible.

And it was really a problem to test fulfillment of rehabilitation requirements in third period, because of absence of rehabilitation specialists in villages of Zhytomyr region (3 rehabilitation specialists per 93 villages); because of absence of required rehabilitation equipment in village medical centers, because of absence of PR complex methodic for all rehabilitation periods. That is why for such patients physical therapeutic prescriptions were restricted by usage of UNF or non traditional factors 9th – 10th groups (see tables).

In tables we present examples from Zhytomyr medical-rehabilitation centers. The authors checked carefulness of fulfillment of rehabilitation prescriptions by patients in all periods as well as results of patients' rehabilitation.

Summarizing results of the researches we can conclude that patients, who regularly and carefully followed all doctors' prescriptions in process of complex PR shortened rehabilitation period by 1-3 weeks and turned to training – competition process and full-fledged social life.

Conclusions:

- Combination of rehabilitation methods is specific for every disease, for every patient with after effects of lower limbs' traumas;
- Effective result is possible only after rehabilitation by complex methodic. With it, very important is patients' knowledge about trauma, traumatic disease, terms, methods and factors of rehabilitation. It shall be assisted by visual aids and information, including information about physical therapeutic factors;
- The authors' experience and results of the researches permit to recommend effective schema of rehabilitation course, which was tested in practice of rehabilitation institutions, where its effectiveness and efficiency were tested in combinations: TPC with MT (medical therapy) + PT + TM (therapeutic massage). Such rehabilitation methodic ensures required level of joint mobility and improvement of number of organism's functions.

Further works shall be devoted to studying of other components of complex PR of patients with after effects of lower limbs' traumas as well as creation of descriptive informational materials.

Table

Physical therapeutic factors for physical rehabilitation of patients with after effects of lower limbs' traumas

Group	Description		Action				Prescription			Trauma
	Factor	Device	Character	Specificities	Indications	Counter-indications	Rehabilitation period			
							I	II	III	
I Electric current of low	Electrophoresis	"Stimul" "Ampl-impulse 5" "Tonus 2" "M 717" "Potok 1"	Accelerate metabolism and regeneration of nervous and skin	Concentration of action on limited areas of skin and at certain depth of tissues. Pharmacological effect: injection of medical substances with the help of electric current	Initial atrophy of long muscles, secondary atrophy of smooth muscles, caused by durable immobilization of limb.	Acute purulent processes, bent to bleeding, thrombophlebitis, joint ankylosis, spasms	+	+	+	Any Contusion, stretching of tendons, fractures, arthritis
	DC impulses		Pain-killing electric-stimulation			Acute purulent processes, bent to bleeding, thrombophlebitis, joint ankylosis, spasms	+	+	+	
	AC impulses		Pain-killing electric-stimulation	Anti-spastic effect	Initial atrophy of long muscles, secondary atrophy of smooth muscles, electric stimulation of muscles			+	+	

III Electric and magnetic fields	DC and impulse magnetic fields	"Polus 101" "AVIMP"	Pain killing anti spastic, anti inflammation effect	Regeneration of all kinds of muscles, periphery nervous, skin	In acute period with non purulent inflammation processes, contusion, bruises	With systemic diseases of blood, new creations in spine cord and brains, with active bone tuberculosis	+	+	+	Fractures, joints, tendons , muscles , Achilles tendon's rupture
IV Light	Infra-red, visible	"OPC", "Infra-rouge"	Resorption and anti spastic effect	Acceleration of metabolism and physical thermal regulation, intensification of blood circulation	Thermal rehabilitation methods at stage of resorption of infiltrates	With systemic diseases of blood, new creations in spine cord and brains, with active bone tuberculosis, photo- dermatosis		+	+	Stretching, contusion, fractures, arthritis

IV Light	Ultra-violet, group A (long wave)	"ORS"	De-generation of inflammation processes, indirect bactericidal, anti-rickets effect	Increasing of biological substances' content in tissues, generation of vitamin D in organism, assimilation of bone and tissue phosphorus and calcium	Thermal rehabilitation methods at stage of resorption of infiltrates	With systemic diseases of blood, new creations in spine cord and brains, with active bone tuberculosis, photo-dermatosis	+	+	+	Stretching, contusion, fractures, arthritis
	Ultra-violet, group B (middle wave)		Anti-rickets, immune-increasing, hardening effect	Quick creation of bone spur, regeneration of all kinds of tissue			+	+	+	Any fractures, arthritis
	Ultra-violet, group C (short wave)	"Tubusquarts"	De-generation of inflammation processes, direct bactericidal, anti-viruses effect	Increasing of biological substances' content in tissues, generation of vitamin D in organism, assimilation of bone and tissue phosphorus and calcium			+	+	+	Acute arthritis, pain, swallowing, wounds
V Mechanical oscillations	Super-sonic	UZT101 UTP1 UZTS	Pain killing anti spastic, anti inflammation effect	Regenerative processes at level of tissues, increase of blood leukocytes' activity	Thermal therapeutic methods, sub acute and chronic inflammation, dystrophic processes, post traumatic condition of SMS, scars	With systemic diseases of blood, new creations in spine cord and brains, with active bone tuberculosis		+	+	Fractures, arthritis, bursitis, tendonitis

VIII Radio active factors	Radon water, applicators	Baths	Anti-inflammatory and desensitizing, resorption effect	Reduction of CNS sensitivity, increase of immune biological activity of organism	In period of rehabilitation between acute periods and in period of stable remission with arthritis, arthrosis and other SMS diseases	In purulent acute periods, in period of pregnancy, with active tuberculosis of bone tissue and any new formations		+	Fractures, arthritis, bursitis, tendonitis
IX Water therapy factors	Fresh water. Artificial mineral water	Baths	Mechanical, chemical irritations, showers, rubbing and so on	Reduction of CNS sensitivity, increase of immune biological activity of organism	In period of rehabilitation between acute periods and in period of stable remission with arthritis, arthrosis and other SMS diseases	In purulent acute periods, in period of pregnancy, with active tuberculosis of bone tissue and any new formations		+	General-strengthening
X Thermal therapy factors	Peat, paraffin, Mineral wax, glue, naphthalene, sand, mud	Steam baths	Anti-allergy, anti-inflammatory, resorption effect; pain killing anti spastic effect	Widening of periphery blood vessels, acceleration of trophic function	Thermal therapeutic methods with continued in time effect in period of infiltrates' resorption. Mud baths – only in period of stable remission	In purulent acute periods, in period of pregnancy, with active tuberculosis of bone tissue and any new formations, epilepsy		+	Fractures, arthritis, bursitis, tendonitis
Notes: «+» means that the mentioned method of physical therapy is to be used in the given period of rehabilitation									

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