

Dynamics of indicators of respiratory function in elderly men under the influence of rehabilitation measures in the immobilization period of the disease after the fractures of the tibial plateau

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Purpose: to determine the effectiveness and justify the use of physical rehabilitation on respiratory function of patients with older men who are in immobilization period of the disease after the fractures of the tibial plateau.

Material & Methods: analysis of special scientific and methodical literature; analysis of medical records of patients under study; methods of research indicators of respiratory function; methods of mathematical statistics. Analyzed contingent – 15 male patients of advanced age who are in a hospital in the immobilization period after fractures of the tibial plateau.

Results: the studies showed significant positive changes in lung function in patients with elderly men under the influence of the proposed complex physical rehabilitation.

Conclusions: the proposed complex of physical rehabilitation can be used in hospital patients who are in the immobilization period (bed, motor mode) after the fractures of the tibial plateau with a view to improving respiratory function and prevention of complications in the respiratory system due to the reduction of motor activity after the injury.

Keywords: fracture of the tibial plateau, respiratory function, the means of physical rehabilitation.

Introduction

Injuries, according to the World Health Organization (WHO), is important not only medical but also social problem which concerns a diverse population and is characterized by constant growth injury, a significant level of disability, and major economic costs, experiencing trauma, their families and the state [5]. In recent years, attracted the attention rehabilitators injured knee, which make up 10–22% of all lower extremity injuries [4; 7], among them is common, especially in middle and old age, fractures of the proximal end of the tibia (plateau fractures) [1].

Among the early motor complications due to decreased motor activity affected most common and difficult is the development of congestive hipostatychnoy pneumonia [2; 3; 6], which requires the appointment of the first days after surgery or limb immobilization of physical rehabilitation. In the available literature lack reflects the problem of physical rehabilitation of older age groups after intraarticular fractures of the knee, so the development of the program of physical rehabilitation for injured persons from the age of victims, the exact location and the nature of fracture, treatment, stage rehabilitation period of the disease, presence of complications and concomitant somatic pathology is an actual medical problem.

The purpose of the research

To define and research to prove the effectiveness of the complex of physical rehabilitation on respiratory function of patients older man who is immobilization period of the disease after the plateau fractures.

Objectives of the study:

1. Analyse the current professional literature on the problem of physical rehabilitation of patients after fractures plateau.
2. Define and justify changing the parameters of lung function that occur in the affected elderly men in the immobilization period after fracture fee under the influence of optimal rehabilitation.

Material and Methods of the research

Under our supervision in a hospital bed was located in the motor mode injured 15 elderly men (60–70 years), who underwent skeletal traction damaged lower extremity (as the method of staged repositioning) on the closed fractures of the proximal end of the tibia, namely condyle bone fragments shift. Traumatized men were randomly divided into 2 groups: control (CG) – 7 patients; basic (CO) – 8 patients. Most of the victims injured in the street because of ice and while in transport during sudden accident. Research conducted by us for 2 years. Due to reduced physical activity (bed motor mode) and the presence in most patients with concomitant chronic diseases of cardiorespiratory system, we used the following methods: analysis of medical records of victims clinical methods (history, somatoskopiyu, palpation, percussion, auscultation); pulsometry, arterial tonometry, spirometry, pnevmatohometriyu, measurement of chest excursion and frequency of breathing hypoxic test Stange and Ghencea, functional tests Rosenthal, medical and pedagogical observations, methods of mathematical statistics. All studies were conducted according to conventional methods. The results of lung function parameters were processed using software Microsoft office,

Results of the research and their discussion

Initial examination of the studied contingent victims was held on 5–6 day after overlay injured lower limb skeletal traction, re – 2–3 day after withdrawal (28 days). In the primary of the patients complained of pain in the injured limb, the appearance of swelling toes, insomnia, irritability or depression. A history and histories of patients showed the presence of most of these concomitant somatic pathology of the different systems of the body: hypertension degree of I–IIA – in 26,6% of patients, coronary heart disease – in 33,3%, chronic bronchitis – in 66,6%, diabetes – 20%, asthma – 6,64%, chronic gastritis – in 13,3%. When comparing the value of the index of the functional state of the respiratory system of patients and the main control groups did not reveal significant differences between them on all parameters specified function of the respiratory system (Table).

The data history and medical records and the results of the initial survey of the functional state of the studied group of patients showed the homogeneity of both groups and reduced respiratory function compared with appropriate indicators of healthy men of this age (according to the data resulted G. A. Makarova, 2002; O. P. Smirnova, 2014 [8]), in our opinion, was not only due to a decrease in motor activity affected (bed motor mode because of injuries and treatment), but also the presence of the affected concomitant chronic diseases of the respiratory system.

To improve respiratory function and prevent possible development hipostatychnoy pneumonia we proposed the use of a means of physical rehabilitation for male patients of the main group, which includes a modified technique of breathing exercises on a background of generally accepted for this period of illness and treatment exercise, ultrasound inhalation dekasana and classical technique therapeutic massage chest.

The distinctive features of our proposed set of physical rehabilitation assignment is 20–30 minutes. Ultrasound dekasana after inhalation (10 min) physiotherapist occupation, which in the main after the general development exercises for the body, the muscles of the neck, upper limb and lower limb healthy and special exercise for damaged limbs, used static breathing exercises (from 2–3 min to 6–8 minutes) through additional dead space “DMP”. Research several authors [2; 6] show high efficiency breathing “DMP” hipostatychnoy to prevent pneumonia in patients with significantly reduced physical activity due to the presence of serious injuries (burn disease, hip fractures, etc.). The authors found that while breathing through a “DMP” function not only respiratory muscles, but the muscles of the neck, abdomen and torso, chest and the associated energy consumption efforts eliminate the negative impact of hyperventilation observed in the performance of conventional static exercise muscle in a state of rest. After 40-60 minutes. therapeutic exercises classes after patients received treatments of massage therapy for chest classic technique.

Affected male control group received inhalation eufillin, doing

The evolution of respiratory function affected men and the main control groups influenced rehabilitation

No.	Indexes	Examination	Control group (n=7)	Basic group (n=8)	t	p
			$\bar{X} \pm m$	$\bar{X} \pm m$		
1.	Respiration rate per minute	I	23,86±0,90 t=2,84; p<0,05	24,0±0,85 t=5,50; p<0,001	0,06	>0,05
		II	20,57±0,74	18,5±0,53	2,27	<0,05
2.	Excursion chest, cm	I	3,74±0,05 t=1,64; p<0,05	3,76±0,06 t=5,83; p<0,001	0,25	>0,05
		II	3,86±0,05	4,16±0,04	5,13	<0,001
3.	Vital capacity, l	I	3,31±0,04 t=5,26; p<0,001	3,28±0,07 t=5,83; p<0,001	0,23	>0,05
		II	3,61±0,04	3,73±0,04	2,15	<0,05
4.	Breath to breath, s	I	34,71±0,45 t=1,96; p<0,05	34,13±0,55 t=4,86; p<0,001	0,41	>0,05
		II	35,86±0,37	37,58±0,37	2,90	<0,05
5.	Breath exhale, s	I	14,29±0,61 t=1,54; p<0,05	14,25±0,61 t=3,81; p<0,01	0,02	>0,05
		II	15,57±0,57	17,38±0,53	2,31	<0,05
6.	The power of inspiration, l·s ⁻¹	I	3,30±0,10 t=3,25; p<0,01	3,34±0,08 t=4,09; p<0,001	0,18	>0,05
		II	3,69±0,07	3,69±0,04	0,02	<0,05
7.	Power exhale, l·s ⁻¹	I	3,16±0,07 t=2,75; p<0,05	3,21±0,07 t=4,81; p<0,001	0,29	>0,05
		II	3,43±0,07	3,64±0,04	2,37	<0,05
8.	Rozentalya sample:types of reactions: – satisfactory – unsatisfactory	I	2–28,6%	2–25%		
		II	4–57,2%	7–87,5%		
		I	5–71,4%	6–75%		
		II	3–42,8	1–12,5		

therapeutic exercises for common injuries and for this period of the disease and the method of receiving therapeutic massage treatments for chest classic technique.

Under the influence of the proposed complex of physical rehabilitation for men the main group and the conventional hospital complex for the affected control group there were positive changes values parameters of lung function investigated troops injured in both groups, but the most expressive positive dynamics of these options is most clearly observed in the patients of the group (Table).

Comparative analysis of parameters of lung function of external breathing the percentage spent between groups of male patients, testified reliable increase of these quantities in the main group affected against the background of a significant decrease in respiratory rate at rest and increased chest excursion (Table).

Thus, the increase in value of the index VC men in the main group was 13,7%, against 9,0% – kontrolnoyi group; increase the quantities duration of breath at inhalation and exhalation men was the main group respectively 10,1% and 12,1% versus 3,3% and 8,9% – in the control group; increase performance capacity inhalation and exhalation of patients the main group constituted respectively 10,04% and 13,3% versus 9,0% and 8,5% – in the control group. It is necessary to note the significant increase in response to such a satisfactory sample Rosenthal core group of men.

Received regular growth dynamics parameters of respiratory function showed improvement airway, increasing the endurance of the respiratory muscles, the stability of the respiratory system of the body of patients the main group to hypoxia, which led to a significant improvement of lung function and absence of all patients hipostatychnoy pneumonia (accord-

ing to medical records). But the value derived indicators of the functional state of the respiratory system have not reached the proper parameters of healthy men age, in our opinion, was appointed term duration due to research and presence in most patients with concomitant chronic diseases of the respiratory system.

Conclusions

1. Analysis of the sources of modern literature revealed the need for the appointment of the patients in the first immobilization period after fracture plateau of physical rehabilitation with a view to not only accelerate the formation of primary callus in the fracture, but also prevention and elimination of possible complications in the cardiorespiratory system by reducing motor activity (bed motor mode), especially in the elderly.

2. The used complex methods of research of health and functional status of the respiratory system affected elderly men revealed during the initial examination prohodymosti deterioration of the respiratory tract, reduced endurance of the respiratory muscles and respiratory system resistance to hypoxia, indicating a significant reduction of lung function in patients of both groups.

3. The complex of physical rehabilitation for the main group of men using a modified breathing exercises, ultrasound dekas-anu inhalation and therapeutic massage to be effective and has significantly improved respiratory function and prevent the development hipostatychnoy pneumonia.

The prospect of further research related to the development of science-based physical rehabilitation program for injured people after the plateau fractures in regenerative period of the disease.

Conflict of interests. The author declares that there is no conflict of interests.

Financing sources. This article didn't get the financial support from the state, public or commercial organization.

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Received: 06.03.2017.

Published: 30.06.2017.

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