ного красителя акридиновый оранжевый. Наблюдалось зеленое свечение микробных клеток с нативной ДНК и красное свечение микробных клеток с денатурированной ДНК в результате процессинга антигена.

После воздействия синего (длина волны 440 нм) и зеленого (530 нм) света и тромбоцитарного фактора роста выявлено увеличение количества клеток, экспрессирующих костимулирующие молекулы CD4+CD28+ (в среднем до 35%) и регуляторные молекулы CD4+CD25+ (в среднем до уровня 1,2%). Наблюдалась нормализация показателей циркулирующих иммунных комплексов и пептидов средней молекулярной массы после комбинированного лечения. Изменение уровня субпопуляций Т-лимфоцитов, как и активация факторов иммунорезистентности, указывает на эффективность комбинированного лечения.

Выводы. Сочетанная терапия с применением светового воздействия с различными длинами волн и тромбоцитарного фактора роста приводит к активации фагоцитоза и функциональной активности Т-лимфоцитов, и таким образом, позволяет усилить общую резистентность организма, нормализовать периферическое кровообращение и ускорить заживление ран.

THE OPTICAL-ELECTRONIC DEVICE FOR INTEGRATED EVALUATION OF COLLATERAL CIRCULATION OF LOWER EXTREMITIES

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Introduction. Nowadays more and more methods, based on application of laser and optoelectronic devices, are introduced in medical diagnostics. These methods include photoplethysmography, that enables to measure blood flow and vascularity both in basal veins and arteries and in peripheral vessels and capillaries.

The problem of violations of the peripheral blood circulation is becoming more important. In conditions of modern scientific and technological progress which is increasingly causing a negative influence on the environment, including human health, the age of many diseases associated with disorders of the peripheral blood circulation began to fall critically. For successful treatment of a disease it is important to conduct timely diagnosis, because identification of some problems at an early stage greatly increases the probability of the patient's full recovery. Therefore, the development of new diagnostic devices is making great contribution to the development of modern medicine.

Practical realization. The source of infrared radiation (wavelength of 905 nm) is used to study the deep layers of the skin. To determine blood oxygen saturation a red light source is used (wavelength of 660 nm). Green radiation source (wavelength of 532 nm) emits luminous flux that penetrates only in cor-

neous and epidermal skin layers (0.3 mm) that allows exploring the surface layers of the skin definitely.

For assessment of local blood flow, we conducted laser photoplethysmography, using the developed photoplethysmographic device. A high-amplitude shape of regular discontinuous signal corresponded to pulsatile blood flow with large volume and a low-amplitude shape of irregular chaotic signal corresponded to non-pulsatile blood flow.

In doubtful for diagnosis and prognosis cases the change of signal in the reactive hyperemia conditions was evaluated.

Results and discussion. 26 patients received surgical treatment of local hypertensive-ischemic pain syndrome of amputation stumps of lower extremities by the method of semiclosed fasciotomy in combination with revasculazing osteotrepanation.

Three weeks after treatment all the patients felt considerable decrease of pain and improvement of general state. Patients of the first group, where semiclosed fasciotomy was applied, suffered from moderate manifestations of painful and circulatory disorders in amputation stump. Patients complained to periodic aching, dull pain in amputation stump. In the area of stump end bluish discoloration of skin and moderate venous hyperemic were recorded in 33% (4) of patients.

In the patients of the second group, where to semiclosed fasciotomy revasculating osteatrepanation was added, primary healing of post-operative wound, lack of pain syndrom both under loading and in motionless state were observed. Skin of amputation stump became of pale-red discoloration, congestive and vascular manifestations sharply decreased.

Resuming of prosthesis usage caused moderate pain manifestations in 25% (3) of patients of the first group and in 7.1% (1) of patients-second group, sense of discomfort - 33% (4) of patients and in 21.4% (3) of patients, correspondingly.

By the results of studying hemodynamic indices it is noted that in the patients of the first group the blood filling level increase of amputation stump was moderate by 46.5% and the level of diastolic outflow increased only by 31%. Dynamics of pain intensity decrease in this group of patients also was inexpressive and was 62.7% (19.2±4% points). Saturation of soft tissues with oxygen and threshold of pain pressor sensitivity increased moderately by 30% (74.4±2.2%) and 38.6% (52.1±1.5 mm Hg) correspondingly (Table 1).

Conclusions. Paper analyzes the principles of interaction and analysis of the reflected optical radiation from biotissue in the process of assessment of regional hemodynamics state in patients with local hypertensive-ischemic pain syndrome of amputation stumps of lower extremities, applying the method of photoplethysmography.

Local hypertensive-ischemic pain syndrome of amputation stumps of lower extremities is developed on the background of vascular and ischemic disorders in the tissues of stump and is manifested by the pain, edema, increase of subfascial pressure, sharp decrease of regional hemodynamics indices.

Table 1

Indices of microcirculation level assessment prior to the therapy and after treatment of patients

Indices*	I group of patients, n=12		II group of patients, n=14	
	Prior to therapy	After treatment	Prior to therapy	After treatment
LRBF, su	8.8±2.5	9.8±3.1	9.7±1.4	28.5±6.4*#
TRBF, ms	58.8±15.7	61.8 ±23.7	59.9±9.5	65.7±11.4*
LSBF, su	8.8±2.8	11.5±1.4*	10.5±2.8	23.9±5.8*#
TSBF, ms	71.7±26.7	79.4±19.1*	68.4±6.7	84.5±20.8*
LGBF, su	18.7±3.1	27.4±2.7*	20.2±4.8	52.4±4.8*#
LDO, su	7.1±3.1	9.3±1.9*	6.9±1.4	11.4±2.5*#
SpO_2	37.6±1.9	52.1±1.5*	38.3±1.3	63.7±2.1*#

Notes: LRBF - level of rapid blood filling; TRBF – time of rapid blood filling; LSBF - level of slow blood filling; TSBF –time of slow blood filling; LGBF - level of general blood filling; LDO – level of diastolic outflow; * – P<0,05 compared with the state prior to therapy; # – P<0,05 compared with the first group.

Surgical treatment of local hypertensive-ischemic pain syndrome of amputation stumps of lower extremities by the method of semiclosed fasciotomy in combination with revasculazing osteotrepanation enabled to improve considerably regional hemodynamics in the tissues of stump and reduce pain and congestive disorders.

ОСОБЛИВОСТІ ПЕРЕБІГУ І ЛІКУВАННЯ ПОСТТРАВМАТИЧНОГО ОСТЕОМІЄЛІТУ ДОВГИХ КІСТОК НИЖНЬОЇ КІНЦІВКИ ІЗ ЗАСТОСУВАННЯМ ЕНДОЛІМФАТИЧНОЇ ЛАЗЕРНОЇ ТА АНТИБІОТИКОТЕРАПІЇ

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Вступ. Лікування травматичного остеомієліту складає вагому медико-соціальну проблему, коли пацієнтами, в переважній більшості, є особи молодого, працездатного віку. Таким хворим проводиться довготривале, затратне лікування із частковим позитивним результатом та виходом на інвалідність. Особливу увагу ми надаємо при лікуванні пацієнтів з посттравма-