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INFUSION PORTABLE SYSTEM

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Abstract IPS is a device for infusion therapy in extreme conditions. The device is capable of infusion therapy in different mods. IPS has unique qualities for this device group.

Introduction. Modern infusion systems designed to assist patients in the comfortable conditions of hospital or home treatment. Traditional and modern mechanized, high-precision, expensive and heavy infusion systems used in hospitals do not have the mobility and are non-wearable. In addition to mobility, there is a need to provide a therapeutic effect infusion in extreme conditions. Extreme conditions are the eliminations of consequences of emergency situations, or aiding by military doctors on a battlefield and other situations.

Materials and Methods After research the needs of special medical units, we have developed principles of IPS:

- 1) Capacity infusion solution with protection against mechanical damage
- 2) Lack of specific consumable materials. This makes it possible to integrate our device in existing medicine standards
- 3) The ability to extend the functionality of the add-on modules
- 4) Reuse System
- 5) The lack of strict orientation in space
- 6) A lightweight construction
- 7) Wearable system

According to these principles have been developed and constructed a device for infusion therapy.

Results After researching the needs of specialized medical departments have been developed IPS principles. In accordance with the principles of IPS it was designed and constructed a device for infusion therapy in extreme conditions. Now the device is held pre-clinical trials.

Discussion and Conclusions At this stage, IPS successfully realizes the basic functions. The totality of these properties does not have any one device on the market of infusion systems.

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HYPERBARIC OXYGENATION AND ANTIOXIDANTS IN THE TREATMENT OF DEEP BURNS

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Topicality. Deep burns therapy is a great problem in combustiology and surgery. At present, a significance of the radicals reactions of lipid peroxidation (LPO) in molecular basis of the wound process is known [1]. Correction of LPO disorders in wound therapy is the basis of pathogenetic application of antioxidants and hyperbaric oxygenation (HBO). These are natural antioxidants, obtained out of the wood of Dahurian larch – dihydroquercetin (taxifolin) and arabinogalactan [2]. Besides, hyperbaric oxygenation stirs up phagocytic activity of reparation cells and rate of their entering the wound, stimulates antibacterial therapy action [3].

Objective: to assess the results of complex application of hyperbaric oxygenation and antioxidants (dihydroquercetin and arabinogalactan) in the treatment of patients with deep burns.

Materials and methods: the analysis of therapy results of 28 patients with burns of the III degree (ICD-10) was carried out. Among them there were 20 men (71,4%) and 8 women (28,6%) at the age of 24-66. Etiology of thermal burns: scalds – in 18 patients (64, 3%), flame burns – in 9 patients (32,1%) and electric burn – in 1 case (3,6%). Burn shock of the I-II degrees was marked in 2 patients with the burn area of 15% and 18%. Duration of the course of the wound process was from 28 days till 3,2 months. On the average the area of thermal wounds – $530,8 \pm 11,7$ cm².

The main group (MG) included 14 patients receiving HBO and antioxidant therapy. Antioxidant therapy included oral intake of biologically active supplement containing flavonoids' formula of dihydroquercetin and arabinogalactan (1 : 3) in the dose of 1 capsule twice a day during 21 days from the beginning of therapy. Besides, after stopping burn shock and performing necrectomy the patients of the main group received 4 procedures of HBO in 1,5-1,8 atm during 40 minutes daily in pressure chamber "OKA-MT". Then postponed

autografting was performed with free split thickness graft which was covered with paraffin wound coverings. Beginning with the first days of the postoperative period antioxidant therapy and 6 procedures of HBO in 1,5-1,8 atm were continued. The group of clinical comparison included 14 patients which received traditional therapy. Patients of the main group and the clinical comparison group (CCG) are comparable in sex, age, degree and area of burns.

Curative procedures for the patients of both groups included antibacterial and symptomatic therapy.

The results were analysed on the basis of indices of the course of wound process, cytological study, the study of LPO (diene conjugate – DC), (malondialdehyde – MDA) and antioxidant defense (vitamin “E”, ceruloplasmin) on the first and 21st day of therapy. The degree of differences was significant at $p < 0,05$.

Results: the period of preoperative preparation reduced to $6,4 \pm 0,6$ days in patients of the main group in comparison with the CCG – $10,2 \pm 1,6$ days ($p < 0,05$) due to more active course of the wound process. A complete engraftment of a free autograft was observed in the MG patients in 97,6 % of cases and in the CCG patients – only in 72,5 % of cases. Duration of the temperature reaction made up $8,9 \pm 0,6$ days and that of the wound syndrome made up $8,4 \pm 0,7$ days in the MG, however, in the CCG these indices made up $14,6 \pm 0,7$ days and $13,9 \pm 1,5$ days respectively ($p < 0,05$).

On the first day of therapy cellular composition of the wounds didn't greatly differ in patients of both groups. On the 21st day of therapy restorative and regenerative –and-inflammatory types of cytograms were determined in the MG patients, while the CCG patients still had inflammatory-regenerative type of cytograms.

At the beginning of therapy in patients of the MG and CCG there were no great differences in indices of LPO and AOD. On the 21st day of therapy indices of m.u. decreased 45,8 % and RC – 44,9 % in patients of the MG while in the CCG patients indices of m.u. decreased 21,4 % and RC – 32,7 %. The content of AOD components increased much more in the MG than in the CCG. In patients of the MG the content of vitamin “E” increased 37,1 % and ceruloplasmin 33,4 %, however, in the CCG – 7,7 % and 2,6 %, respectively.

Conclusion. Application of HBO and antioxidant therapy favours the correction of LPO and AOD disorders, thus it allows to improve the results of treatment of patients with deep burns.

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CYTOFLAVIN IN THE CORRECTION OF REPERFUSION ARRHYTHMIAS

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Abstract Reperfusion arrhythmias are the result of the dramatic cellular, metabolic and local electrophysiological changes during restoration of coronary blood flow. The given pathophysiological mechanisms of their occurrence, justified the use of metabolic agents that have a cardioprotective effect, along with standard anti-arrhythmic therapy. The results of these studies demonstrated the efficacy of cytoflavin in the correction of processes of lipid peroxidation in patients with reperfusion arrhythmias.

Key words: cytoflavin, reperfusion arrhythmia, biological membranes lipid peroxidation, products of peroxidation (lipid hydroperoxides, diene conjugates, malonic dialdehyde), antioxidant system.

Recently, it is believed that the main therapeutic measures in patients with reperfusion arrhythmias should be directed at correction of metabolic and electrolyte balance, elimination of ischemia/reperfusion injury of the myocardium in the pathogenesis of which of great importance are the processes of lipid peroxidation, cytotoxic free radicals. The most studied effect of such metabolic means like trimetazidine, magnesium sulfate, mildronat, dipyridamole, cytoprotective action which is implemented by means of neutralizing or reducing the impact of damaging factors on the cell membrane of viable myocardium during ischemia. The aim of this work was to study the effects of cytoflavin on the intensity of peroxidation processes in patients with reperfusion arrhythmias. Cytoflavin ("Polisan") is a complex drug consisting of succinic acid, riboxin, nicotinamide, riboflavin mononucleotide, N-methylglucamine.

Materials and methods. The study was conducted in conditions of the resuscitation and anesthesia Department of the Amur regional clinical hospital on 40 patients. The control group of patients not cytoflavin injected. The experimental group patients, along with standard anti-arrhythmic therapy was administered to 20 ml of cytoflavin intravenously 30 minutes before coronary angiography (stenting). Blood sampling was per-