Application of Cryopreserved Amniotic Membranes
In Therapy of Neurotrophic Ulcers
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Nowadays the neurotrophic ulcers are diagnosed in 2% of working age people. There has been designed a variety of drugs for this pathology therapy, but the use of most of them does not provide rapid healing of the lesion focus and results in side effects development [Tricco A.C., 2015]. The research aim was to determine the efficiency of applying the cryopreserved chorionic (CM) and amniotic (AM) membrane fragments in therapy of experimental neurotrophic ulcers of limb.

The research objects were the amniotic membrane fragments, cryopreserved by previously developed technique. Neurotrophic ulcers were simulated in mice by intradermal injection of 0.1 ml 9% acetic acid followed by thermocoagulation of neurovascular bundle in the area of origin of femoral and iliac vessels. The AM and CM were applied onto the entire area of the ulcer for 24 hours, and the comparison group was treated with Solcoseryl ointment. The dressings were applied four times each 48 hrs. An average area (AA) of ulcer, functional ‘foot error’ test, morphological changes in tissue structure within an injured area were estimated.

At the start of therapy the ulcer AA was 64 mm², the limb looked oedematous and cyanotic, the animal could not lean on it. Morphological examination showed the formation of a wound defect, filled with necrotic masses, densely infiltrated with neutrophilic leukocytes. In the depth of the defect we revealed the remnants of dermal connective tissue fibers and muscular fibers of intrinsic skin muscle. To day 11 after first application of the CM and AM the ulcer AA was 28 mm², and the amount of incomplete steps was 15 and 25%, respectively. The ulcer was completely clean and the lesion was filled with normal granulation tissue with vertical vessels. In non-treated animals and in those after applying Solcoseryl ointment the ulcer AA was 36–38 mm², the animals made 30 and 36% of foot errors. The tissue, surrounding the lesion area was quite mature, had granulation with moderate content of macrophages and lymphocytes. The lesion surface was covered with a scab. A moderate marginal epithelization of the defect was revealed. To day 25 after the first CM and AM application the ulcers were completely healed, a functional ability of the limb was recovered. A complete epithelialization of ulcers was showed morphologically. The granulation tissue was substituted with mature and normal newly formed connective tissue. In non-treated animals and in those after applying Solcoseryl ointment the ulcer AA was 15 and 10%, respectively, the animals made 10% step failures. A significant reduction in size of wounds occurred due to a pronounced marginal epithelization as shown morphologically.