MUCOSAL LYMPHATIC NODULES OF RATS WITH SKIN EXPERIMENTAL BURN TRAUMA UNDER THE ACTION OF HECOTON SOLUTION

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Introduction. Intestinal mucosal barrier is formed by intestinal epithelial cells and intestinal intraepithelial lymphocytes that reside between them [1]. Mucosal lymphatic nodules (Peyer’s patches) associated with mucous
membranes form a protective barrier against antigens. The function of Pey-
er’s patches involves recognition luminal antigens, inducing an immunologi-
cal response and decreasing the incidence of antigen translocation across the
mucosal epithelium [2].

That is why it is interesting to study their reactive changes in such a mul-
tiorgan disease as burn disease, which is affected many factors such as oxy-
genation, infection, aging, hormones, and nutrition [3].

The aim of the work. Microscopic and ultramicroscopic study of the il-
eum lymphoid nodules (Peyer’s patches) structure of rats with burn disease
and infusion of hecoton solution.

Materials and methods. Experimental animals were divided into 3
groups (18 animals in each group): I – intact animals; rats of groups I and II
were infused with a solution of a new hyperosmolar drug «Hecaton», which
was registered in Ukraine in 2013 (Certificate NUA/13224/01/01), at a dose
of 10 ml/kg. Animals of group II – without experimental burn skin injury,
III – with experimental burn skin injury. The solutions were infused for
5 minutes into the caudal vena cava after catheterization under aseptic condi-
tions through the femoral vein. The first infusion was performed 1 hour after
the application of the experimental burn injury of the skin, subsequent injec-
tions were performed once a day for the first 7 days of the experiment. Mat-
terial was collected from rats under deep thiopental intraperitoneal anesthesia
1, 3, 7, 14, 21 and 30 days after experimental skin burn injury. The structure
of lymphoid nodules of the ileum (Peyer’s patches) was studied histologica-
lly (stained with hematoxylin-eosin with subsequent examination under an
Olympus BX51 microscope) and electron microscopically methods (fixation
in a solution of glutaraldehyde in the production of semi-thin and ultrathin
sections on an ultramicrotome LKB-3 (Sweden)) with subsequent study on
an electron microscope PEM-125K) [4].

Research results. Compensatory-adaptive effects of hecoton intravenous
infusion on the experimental burned animals ileum lymphoid nodules struc-
ture are characterized by inhibition of normal structure lymphocytes and
apoptotic lymphocytes necrosis. Infusion of Hecaton solution helps to pre-
serve the normal structure of the nodular lymphatic capillaries.

Apoptotic clearance is normalized. There is a structural preservation (and
increase in structural resistance) of dendritic cells and macrophages, which
allows the normal course of antigen-presenting and phagocytic function. The
observed changes in lymphocytes are a manifestation of their stress response
to burns, which consists of initial adequate damaged lymphocytes apoptotic
elimination, subsequent regenerative proliferation program energy supply
disruption or adaptive response failure – in chaotic and asynchronous apop-
totic and preserved cells necrotic destruction.
There is also a tendency to wavy changes in the average cross-sectional area of blood capillaries in ileum lymphoid nodules clusters of rats with experimental burn skin trauma. The cross-sectional area of blood capillaries increased statistically significantly, respectively 16,0% і 12,0% (p<0,05).

Conclusions. Thus, the results of our study indicate that Hecaton solution infusion compensated for the detected alteration manifestations with experimental skin burn trauma. It is carried out by protecting cells from damage that leads to cell death; by increasing the intact cells proliferation; and also involving additional mechanisms that change the conditions and rate of immunocompetent cells recirculation. Our results indicate an integrated response of the immune system to burns, which can be optimized and stabilized with timely and adequate infusion therapy.

References: