Immune Response of Organism and Spontaneous Apoptosis of Lymphocytes in cases of Traumatic Shock.

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Concentration of CD3, CD4, CD8 and indicator of apoptosis are studied on different stages of traumatic shock in the blood of patient. It is indicated that during the bone fracture function of suppressors are decreased and during accompanying shock helper function. During the fracture of long bones apoptosis of lymphocytes are decreased and it lowers even more during accompanying traumatic shock.

Key words: Immune Response, Spontaneous Apoptosis, Traumatic Shock

In pathogenesis of traumas, the main role is given to the emergence of insufficiency of cell bound immunity. he factors of trauma according to their gravity and reactivity of the organism cause the changes in proliferation and activation of immunocompetent cells.

The programmed death of cells (apoptosis), as an active genetically coordinating process, and plays an important role in maintenance of all cells' vitality of the organism.

The phenomenon of apoptosis has a special importance for immune system cells, the lifecycle of which is characterized by the multiple processes of activation, differentiation and proliferation [1.3].

It is considered that many pathological processes including immunodeficiency caused by acute and chronic inflammations, traumatic tissue injures and different stress influences on the organism, is related to the dysfunction of apoptosis' regulation.

Considering above mentioned the goal of the work was to study the apoptosis of lymphocytes and immune characteristics of traumatic shock in cases of traumatic shocks.

Materials and methods:

The research was based on the immunological examination data of 40 traumatic patients in Gudushauri National Medical Center (with fractures of long trunk bones) with age range from 20to 65 years. We have studied CD3, CD4, CD8 and spontaneous apoptosis of lymphocytes (%).

Involvement criteria: patients with the fractures of long trunk bones.

Exclusion criteria: grave autoimmune and systemic diseases.

The data were divided into the following groups: 20 patients with fractures of long trunk bones without traumatic shock – I group; 20 patients with fractures of long trunk bones accompanied with traumatic shock –II group. The data of 50 actually healthy donors were taken as a control.

The cell-bound immunity was assessed according to the monoclonal antibodies of T lymphocytes against the T general – CD3, the T helpers – CD4 and against the T suppressors – CD8. The lymphocytes phenotyping was made via multi parameter two-colored method of immune fluorescence analysis (during staining of monoclonal antibodies FITS – via F(ab) 2fragments of anti-mouse Dako); via conjugate fluorescence thiocyanate and phycoerythrin. The apoptosis induction was made by method of annexin/propidium iodide staining [2].

Lymphocytes secreted from the peripheral blood were reduced to 2X106 in cell/ml area together with 10%FCS and 1% P/S. The level of apoptosis was determined on 370 in 5% CO2 areas after24 hours of incubation.

After the stimulation the cells were washed in PBS, suspended in 200 microlitre Ca2+ ionized buffer and were incubated via 2.5 microlitre FITC conjugate annexin and 1 microlitre propidium iodide during 10 minutes. The analysis was made according to the cytometry method. The apoptosis was determined according to the indices of cells being at later stage of apoptosis (Ann+/PI+).

The difference between the groups was distinguished by a student's ratio according to quantity index. ($t>1,96$; $p<0,05$). The mathematical support was carried out by usage of SPSS 11-6program packages.

The research results and discussion:

The comparative analysis of cell-bound immunity and apoptosis after the trauma of long trunk bones and in cases of traumatic shock showed the essential difference between data (table 1)

Table №1

The comparative analysis of cell-bound immunity and apoptosis after the trauma of long trunk bones and in cases of traumatic shocks

	Trauma Without shock-I	Traumatic shock	Control III	I-II p	I-III p	II-III
CD3	66,05±10,8	50,1±5,58	72,2±0,7	<0,001	p<0,01	<0,001
CD4	49,9±13,5	32,23±3,67	45,2±0,9	<0,001	>0,05	<0,001
CD8	17,4±4,3	16,2±7,49	25,5±0,6	>0,05	<0,001	<0,001
Apoptosis	33,6±17,3	7,9±4,90	50±1,2	<0,001	<0,001	<0,001

Our data have shown that in cases of fracture of long trunk bones, CD3 is reliably reduced in comparison with the control; it is also reliably reduced in cases of complications with traumatic shock. The reliable difference was noticed between I and II groups, i.e. in cases of shock this parameter is even more reduced. CD4 is insignificantly increased in fractures' group and is reliably reduced in cases of complications with shock; CD8 data are almost equally reduced in both I and II groups in cases of trauma. The special interest is paid to the spontaneous change of lymphocyte apoptosis. In cases of trauma the lymphocyte apoptosis is reliably reduced in comparison with the control, in cases of shocks (II group) the index of apoptosis is reduced to the minimal level that is the response to transistor immunodeficiency.

Thus, in the mechanism of traumatic diseases the important role is given to the immune response of the organism that influences the process of reparation and the disease outcome.

Summary:

In cases of the fractures of trunk bones the suppressor function of cell-bound immunity is reduced, and the helpers are reduced only in cases of traumatic shocks. In cases of the fractures of long trunk bones the lymphocyte apoptosis is reduced, while in cases of complications with traumatic shocks the index of apoptosis is reduced to minimal level.

Literature:

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ორგანიზმის იმუნური პასუხი და ლიმფოციტების სპონტანური აპოპტოზი ტრავმული შოკის დროს

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ტრამვული შოკის სხვადასხვა ეტაპზე შესწავლილია CD3, CD4 და CD8 უჯრედების კონცენტრაციები ავადმყოფთა სისხლში და აპოპტოზის მაჩვენებელები. მითითებულია, რომ ძვლების მოტეხილობების დროს შემცირებულია სუპრესორული ფუნქცია, ხოლო შოკის თანდართვისას კი ჰერპეროლული ფუნქცია. გრძელი ძვლების მოტეხილობისას ლიმფოციტების აპოპტოზი არის შემცირებული და ეს კიდევ უფრო მცირდება ტრამვული შოკის თანდართვისას.

გასაღები სიტყვები: იმუნური სტატუსი, სპონტანური აპოპტოზი, ტრავმული შოკი.