Studying of Interleikin-2 Immunomodular Effect under Critical Conditions

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ABSTRACT

The results showed, that using of Interleikin-2 did not change immunity statistically (P>0,05), before and after treatment, but after using it, the results of immunodeficiency were not increased. Patient of that group did not receive the above-mentioned preparation and the treatment was done by traditional methods. On the next stage of critical condition, immuno-depression was increased. We must take into consideration the fact that in the group of patients who were not cured by Interleukin was noted signs in 48%, but in the group of patients, who took that treatment there was only 18%. The mortality in Interleukin treated group was 42% and in non-Interleikin cured group the Mortality was 60%. The conclusion was made; that Interleikin-2 may be used during critical situation for prevention therapy in critical conditions, together with basic therapy.

KEYWORDS: *critical conditions, immunomodular, interleikin-2*

The critical conditions are associated with immunodeficiency that is reflected on the immunocompetent T- and B-lymphocytes levels and immunoregulating cells of suppressors and helpers and the products of their life-activity (immunoprotein, cytocides). At this stage the increase of the immune status occurs in all cases of the critical conditions not with standing the cause (trauma, bleeding, intoxication, infection platienfy age etc). Moreover, diagnostic methods (X-ray and radiological studies), curative procedures (operations, lymphosorption, hemosorption, hemodialysis, plasma-pheresis), preparations (glucocorticoids, antibiotics, analgetics, sedatives) can also have immunosuppressive effect. Given the above mentioned facts, under the critical conditions the metamorphosis of the immune reaction becomes the key reason of many complications of the infectious, allergenic and autoimmune character. Those unwanted shifts of the immune status often characterize the patients' condition and the success of his treatment (Z.Kheladze 1987-1990).

In this case, we can see that the search and approbation of those preparations with sufficient modulation effect of the immune reaction become actual provided their effect takes place within the limited period of time. It is possible that interleikins possess such an effect. Moreover, immunotherapy with recombinant cytocides is considered to be one of the most perspective and constantly developing branches of the immunopharmacology.

MATERIAL AND METHODS

Out of 23 adult patients the critical condition was caused by polytrauma (5 cases), concussion (5 cases), acute cerebral disturbance (2 cases), contused lung syndrome (3 cases), firearm wounds (5 cases), gastroduodenal hemorrhage (4 cases).

The control group consisted of 12 adult patients in critical condition caused by any of the above mentioned causes. Then the immune status indices were studied at the different stages.

The patients of both groups were identically treated (controlled ventilation, total intravenous nutrition and other traditional methods of intensive therapy). The antibacterial therapy of the patients of both groups was carried out with carbophenemes (Meroneme, TNM) or cephalosporines of the 3 and 4 generations. (Rocepin, Cefobid, Maxipim).

The patients of the first group were unknowingly administered with Interleikin-2 (Ronkoleikin, "Biotex" Russia). The attending doctors were unaware of the treatment. From the very first hour of admittance each patient has been given 500,000 ME at the rate of 2 ml/ min. for three days.

To estimate the immune status, CD3, CD4, CD8, CD16 and CD72 of the lymphocytes subpopulation have been analyzed by the polarization fluoroimmunoassay. Immunoproteins A,M a G of the blood have also been analyzed by turbidimeter method. (A.Roight,1999).

RESULTS

The results are given in the *Tab.1*: at the stage of critical condition in the control group compared with that at the initial stage, the amount of circulating CD3 and CD4 lymphocytes (43,3±3,2%gr./l 109 and 18,0±2,4%gr./l 109 correspondingly). And serum immunoproteins M (1,6±0,02%gr./l 10 9) and J (18,7±2,9%gr./l 10 9 has statistically decreased (P<0, 05-0,001). The amount of CD16 lymphocytes increased (11,1±1,4%gr./l 10 9. The changes in other parameters of the immune status have not been duly verified (P>0, 05).

We must take into consideration that prior to Interleikin-2 treatment, the immune status indices in the control group statistically differed from that in the basic group (P> 0, 05). The same situation was observed after the curative measures had been completed. We should stress the fact that in this case the immunosuppressive condition was not increased if compared with that in the control group at the late stage of the critical condition. The comparison of data obtained in the control and basic groups at the late stage of the critical condition justifies the above-mentioned fact. In practical, statistically justified changes (P<0,001-0,005) were obtained with the registration of the CD3 and CD4 lymphocytes subpopulation (58,11±1,93%gr/l 109 and 29,2±0,73%gr./l 109 correspondingly) and natural killers CD16 (11, 22±0,2%gr./l 109) and immunoprotein M and J (1,7±0,1%gr./l 109 and 16,6±0,5%gr./l 10 9 correspondingly).

N	GROUP OF PATIENS	IMMUNOLOGICAL INDICES									
		Statistical indises	CD_3 %	CD_4 %	CD_8 %	CD_4/CD_4	CD_{16} %	CD_{72} %	IgA g/l	IgM g/l	IgG g/l
1	Control group at the initial stage of the critical condition	x±m	58,6±1,4	28,0±0,8	25,7±1,5	1,1±0,1	11,1±1,4	19,3±1,7	2,55±0,7	1,65±0,2	18,7±2,9
		n	7	7	7	7	7	7	7	7	7
2	Control group at the late stage of the critical condition	x±m	43±5,2	18±2,14	23,2±1,71	1,0±0,4	19±1,7	12,8±1,71	1,82±0,7	1,1±0,1	11,5±1,3
		n	5	5	5	5	5	5	5	5	5
		$P_{2,1}$	<0,001	<0,001	<0,5	<0,5	<0,02	<0,05	>0,5	<0,05	<0,05
3	Basic group before Interleikin-2 treatment (initial stage of the critical condition)	x±m	55,6±3,40	26,3±0,73	24,1±1,53	1,3±0,8	10,5±0,60	19,6±1,47	3,35±0,46	2,40±1,06	18,05±1,89
		n	24	24	24	24	24	24	24	24	24
		$P_{3,1}$	<0,5	<0,05	>0,05	>0,05	<0,05	>0,05	>0,5	>0,5	<0,5
4	Basic group after Interleikin-2 treatment (late stage of the critical condition)	x±m	58,1±1,93	29,2±0,73	25,2±1,27	1,21±0,06	11,22±0,27	19,7±0,73	2,74±0,22	1,70±0,15	16,6±0,54
		n	24	24	24	24	24	24	24	24	24
		P_1	>0,05	<0,05	>0,05	>0,05	<0,5	>0,5	>0,5	>0,5	<0,5
		P_2	<0,01	<0,01	<0,5	<0,5	<0,01	>0,5	>0,2	<0,001	<0,001
		P_3	>0,05	<0,5	<0,5	<0,5	<0,5	>0,5	>0,5	>0,5	<0,5

Notes: X - average arithmetical index
m - average square-low error
n - umber of options
P - statistical authenicity index; the bottom right-hand figure designates the control group, left- hand figure designates the basic group.

Tab.1 *Pecularitities of the patients immune status in critical conditions before and after Interleikin -2' treatment.*

Thus, though "Ronkoleikin did not statistically change the immune reaction of the patients before and after treatment, the immunodeficiency did not increase with itsusage. The intrahospital infection (tracheobronchitis, pneumonia, sepsis) was indicated among the patient of both groups. There has also been no difference in the analyses of the cultivated biological media (secretion of tracheobronchial tree, blood, urine) among those patients. Among the patients of both groups, there have been 37% cases of St.epidermidis, 37% of B.aeroginasis and 20% of E.Coli. We should say that among the patients that have not been treated with "Ronkoleikin" the infections process of sepsis was occurred in 48% of cases compared with 18% among those treated with "Ronkoleikin". Besides, the patients whose course of treatment included Interleikin-2 were much easier was 42% compared with 60% among those who did not take Interleikin-2.

Conclusion: Interleikin-2 can be used in critical conditions along with the basic therapy to prevent and cure the infection.

REFERENCES:

1. Z.Kheladze. 1987 Immunology for reanimators. "Ganatleba", Tbilisi p.141.
2. Z. Kheladze, New steps in Critical Case Medicine. Critical Care Medicine Institute, Tbilisi, 1998 pp.215
3. A. Roight. Basics of immunology, Moscow, "Mir" p.321

Иммуномодуляционный эффект интерлейкина-2 при критических состояниях

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Р Е З Ю М Е

У больных, находящихся в критическом состоянии, в связи с применением Интерлейкин-2 иммунодефицит не усугубился. Среди лиц, не проводивших подобного рода лечение, иммунодепрессивное состояние заметно ухудшилось. При этом в группе больных которые не получали Интерлеикин-2 признаки сепсиса наблюдались в 48% случаев, а в группе, больных, получавших данный препарат, этом показатель составил 18%. Кроме того, летальность в основной группе больных составила 42%, а в контрольной - 60%. Сделан вывод, что препарат Интерлеикин-2 может быть использован при критических состояниях с целью превенции и лечения инфекционных осложнений базисными средствами профилактики и лечения этих осложнений.

Ключевые слова: *критические состояния, иммуномодуляция, интерлеикин-2*