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A joint use of plasmatic radiation, electric current and nitroglycerin in order to commit progenic precursor cells in critical condition

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Actuality: critical condition involves dystrophic changes and necrosis of separate areas of organs and tissues. Thus, today the goal of the treatment of critical condition is to save layers of non-necrosed undamaged cells and restore their functions. Although no further progress can be achieved in liquidation of critical conditions without restoration of these areas. Until today, no purposeful arrangement of these processes has not been ever brought up. Furthermore, widely discussed issues regarding the reparation of pathological damages incurred as a result of various diseases by means of axial cells, nowadays are represented in the form of transplantation of axial cells, subsequently the issue of committing process of these cells has not been ever raised yet (Z. Kheladze 2007).

Objectives and tasks: Managing the differentiation process of axial cells during critical conditions as a result of joint use of plasmatic radiation, electric current and nitroglycerin.

Material and Methods: 23,0 (100%) patients have been studied, 9,0 (39,1%) women and 14,0 (60,9%) men among them. Transition-age young adults were represented by 8,0 (34,8%), 6,0 (26,1%), the aged and elderly – 9,0 (39,1%). In 5,0 (21,7%) cases critical condition was associated with ischemic insult, in 4,0 (17,4%) cases – with hemorrhagic insult, in 3,0 (13,0%) - with polytraumas, in 2,0 (8,7%) with acute skull-brain trauma, in 2,0 (8,7 %) - with acute sepsis, in 2,0 (8,7 %) - with bronchial asthma, in 2,0 (8,7 %) - with medicinal intoxication and in 1,0 (4,3%) – with acute insufficiency of liver. When admitted to the clinic every patient was suffering from acute insufficiency of the breathing and they have been receiving artificial ventilation from the very first hours. 3,0 (13,0%) patients were under traumatic shock, 2,0 (8,7%) patients with hypovolemic shock and 1,0 (4,3%) patient with exotoxic shock, other patients have been suffering from acute venous insufficiency, besides at the different stages **tumefaction of the brain has been** developed in 13,0 (56,6%), in 3,0 (13,0%) patients - acute liver insufficiency, in 2,0 (8,7%) patients – respiratory distress syndrome of adults and in 2,0 (8,7%) - acute gastric ulceration. Infectious complications have been developed in 12,0 (52,2%) patients, 12,0 (52,2%) among them have been suffering from trachea bronchitis, the latter in 7,0

(30,4%) has been associated with bronchopneumonia and in 2,0 (8,7%) – with acute sepsis and again in 2,0 (8,7%) – with cystitis. When admitted to the clinic every patient was suffering from cerebral coma, the depth of which according to Glazgo scale was equivalent to 3-5 scores in 8,0 (34,7%) patients, 6-8 scores in 9,0 (34,7%) and 9-12 scores in 7,0 (30,4%). When admitted to the clinic patients have been tested by using Apache-2 system, 6,0 (26,1%) of patients gained 10-20 scores, 10,0 (43,5%) patients 21-30 scores and 7,0 (30,4%) – more than 31 scores. All the patients have been treated by using traditional methods, based on state standards for treatment of patients with critical conditions [Z. Kheladze 2002]. The abovementioned treatment included: anti-shock therapy, providing with water and electrolytes, parenteral and enteral nutrition, antioxidant therapy and other means. Parallel to the abovementioned these patients have been simultaneously treated with plasmatic radiation, electric current and nitroglycerin (Zv. Kheladze and others 2008, Zv. Kheladze and others 2008, Zv. Kheladze and Z. Kheladze 2008). 8,2+/- 2,2 bed-days were needed to bring the patients out of the critical condition and back to health. 7,0 (30,4%) passed away, acute disability has been developed in 5,0 (21,7%) within the survived 16,0 patients. With comparatively low level of disability in 15,0 (62,5%) patients so that their life would not be depended on somebody else. A bed-day for these kinds of patients constituted USD 275,0 i.e. equivalent of this amount in GEL. Control group study included 27,0 (100%) identical patients, all of them having been treated by using traditional methods, based on state standards for treatment of patients with critical conditions [Z. Kheladze 2002]. 12,4+/- 3,0 bed-days were needed to bring the patients out of the critical condition and back to health. Lethality index within this group amounted to 44,4%, out of the 15,0 survived patients, 8,0 (29,6%) patients were suffering from high level of disability so that their lives would go on in an associated form only. Out of these patients chronic vegetative condition have been developed in 3,0 (11,1%) patients. The rest of the patients could be able to live lives not dependent upon others, with comparatively low level of disability, a bed-day for these kind of patients constituted USD 390,6 i.e. equivalent of this amount in GEL.

Special study methods conducted on these patients included: determining the number of marrow and peripheral blood cells, estimating the acid-alkali balance of punctuate of the marrow, determining the number of axial and immune competitive cells, carried out by using internationally acknowledged methods (Z. Kheladze 2007).

Results and discussion: the results of studying marrow cells in these patients, showed that after accomplishment of treatment by using combined method, chronologically coinciding the 4th-7th day of the critical condition, having been compared with initial indices (the 1st-3rd day of the critical condition), from the statistical point of view those populations of neutrophils including

promyelocytes (6,1+/-0,8%), myelocytes (17,1+/- 0,9%), meta myelocytes (17,4+/-0,2%) and bacillus-nuclear (18,2+/-1,0%) cells has been increased ($P<0,001$). At a later stage of treatment by using a combined method, on the 8th-15th day of the critical condition compared to those revealed on the 4th-7th day, changes in other cells have not be considered statistically trustworthy ($P<0,05$). Although by this time the given indices tend to decrease, compared to the indices existing before the treatment was begun (on the 1st – 3rd day), increase in their values still could be considered statistically trustworthy ($P<0,001$). Judging from this point of view, populations of eosinophils, basophiles, monocytes, macrophages, proerythroblasts, reticulocytes and plasmocytes have not been modified statistically trustworthy ($P<0,05$).

Judging on the basis of changes in peripheral blood cells right after completion of treatment by using a combined method (on the 4th-7th day of the critical condition), the fact that the number of erythrocytes (4,8+/-0,2.10⁶ cells/ml), leucocytes (16,8+/-1,10⁵ cells/ml), among them rod-shaped leucocytes (15,7+/-0,3%), lymphocytes (19,1+/-1,1) and thrombocytes (378969,3+/-12030,7 cells/ml) has been increased compared with initial indices (the 1st-3rd day of the critical condition), can be considered comparatively statistically trustworthy. Judging from this point of view, changes in other cells have not be considered statistically trustworthy ($P<0,05$). It should be noted, that at a later stage after completion of treatment by using a combined method (on the 8th-15th day of the critical condition), number of peripheral blood cells compared to initial data (the 1st-3rd day of the critical condition), was still increased, although this difference could not be considered statistically trustworthy ($P<0,05$). The difference distinguishing these data from the data recorded after completion of treatment by using a combined method (on the 4th-7th day of the critical condition), was considered statistically trustworthy ($P<0,05$) as well.

Significant changes have been discovered during the study of acid-alkali balance of marrow punctuate, increase in partial pressure of oxygen has been considered statistically trustworthy (52,3+/- 1,5mm, $P<0,001$), the contents of “Basis Excess” has been significantly decreased in the punctuate of marrow (15,2+/-1,3 mm/ml/ml; $P<0,001$), from this point of view changes in other indices of acid-alkali balance have not be considered statistically trustworthy ($P<0,05$). It should be noted that later after completion of the treatment, chronologically coinciding the 8th-15th day of the critical condition, changes in every parameter of acid-alkali balance, compared to the 4th-7th day of the critical condition and the 1st-3rd day of the critical condition, have not been considered statistically trustworthy ($P<0,05$).

Changes in axial and immune competitive cells shows that after completion of the treatment by using a combined method (on the 4th-7th day of the critical condition) having compared to initial data (the 1st-3rd day of the critical condition), increase in the number of CD₃ (39,0+/-0,9%), CD₄

(27,3+/-0,9%), CD₃₄ (10,9+/-0,4) and CD₇₂ (11,6+/-0,2%) has been considered statistically trustworthy (P<0,05-0,001). As for the changes in CD₈ population cells has been considered statistically trustworthy (P<0,05). It should be noted that later after completion of the treatment, on the 8th-15th day of the critical condition, the indices were high still, compared to the data recorded on the 1st-3rd day of the critical condition, although the difference could not be considered statistically trustworthy (P<0,05). The difference distinguishing the data recorded on the 8th-15th day of the critical condition from the data recorded after completion of treatment by using a combined method (on the 4th-7th day of the critical condition), was not considered statistically trustworthy (P<0,05) as well.

The analysis of the abovementioned data shows that the treatment with a combined method results in a significant increase in marrow and peripheral blood cells, erythrocytes, leucocytes, thrombocytes, especially young cells. This increase stays invariably high during the first and the second weeks, parallel to that oxygen supply to the brain and partial pressure is simultaneously increased, partial pressure of carbonic acid and acidity of the environment gets decreased. One should note as well significant increase in progenic axial and immune competitive cells, with a strong tendency to stability. Considerable decrease of complications accompanying critical conditions, lethality index, improvement of disability level, shortening the time needed to overcome critical conditions and cutting down on treatment expenses are of a really big importance as well.

Literature:

1. Z. Kheladze – “State Standards Regarding Critical Conditions and Anesthesiology”, “Temporary Standards For Ambulatory and Stationary Care” Tbilisi, 2002.- 142 pages.
2. Z. Kheladze – “Critical Care Medicine” – Manual for doctors and students, Tbilisi, 2007, - 614 pages.
3. Zv. Kheladze, Z. Kheladze, R. Shonia. Title of the Invention: “A New Direction For The Use of Electric Current” - An Application for a Patent, Identification #10792/01. 01.08.2008
4. Zv. Kheladze, Z. Kheladze. Title of the Invention: “A New Direction For The Use of Nitroglycerin ” - An Application for a Patent, Identification #10810/01. 01.08.2008
5. Zv. Kheladze, Z. Kheladze, S. Jaiani, B. Tsutskiridze. Title of the Invention: “A New Direction For The Use of Plasmatic Radiator” - An Application for a Patent, Identification #10786/01. 07.07.2008

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პლაზმური სხივების, ელექტრო დენის და ნიტროგლიცერინის ერთდროული გამოყენება პროგნოზული პრეკურსორების კომბინირების მიზნით

კრიტიკული მედიცინის ინსტიტუტი, თბილისი, საქართველო

პლაზმური სხივების, ელექტრო დენის და ნიტროგლიცერინის ერთდროული გამოყენების შემდეგ ადგილი აქვს ძვლის ტვინის და პერიფერიული სისხლის უჯრედების როგორც ერთროციტული, ისე ლეიკოციტური და თრომბოციტული ხაზის უჯრედების, განსაკუთრებით კი ახალგაზრდა ფორმის უჯრედების რაოდენობის მკვეთრმატებას, ამასთან ეს მომატება სტაბილურად მაღალი რჩება კრიტიკული მდგომარეობის პირველი-ორი კვირის განმავლობაში. პარალელურად ძვლის ტვინში იზრდება ჟანგბადის შემცველობა და პარციალური წნევა, მცირდება ნახშირორჟანგის პარციალური წნევა და გარემოს მჟავიანობა. საგულისხმო იყო აგრეთვე პროგნოზული დერძული და იმუნოკომპეტენტური უჯრედების მკვეთრი ზრდა, რომელიც ასევე ატარებდა ტენდენციას სტაბილურობისაკენ. ამ ფონზე საგულისხმოა კრიტიკულ მდგომარეობათა თანმდევი გართულებების შემცირება, ლეტალობის მაჩვენებლების და ინვალიდობის ხარისხის გაუმჯობესება, აგრეთვე კრიტიკულ მდგომარეობათა ლიკვიდაციისათვის საჭირო დროის შემოკლება და მკურნალობის ღირებულების გაიაფება.