

**Plasma flow treatment of the acute gastro-duodenal ulceration at ventilator-dependent patients.****Kheladze Z., Jaiani S., Tsutskiridze B., Kheladze Zv., Chakhunashvili D., Chakhunashvili G.****Critical Care Medicine Institute. Tbilisi. Georgia.**

In 48 ventilator-dependent critical patients with acute gastro-duodenal ulceration and subsequent bleeding plasma flow treatment efficacy was studied. The patients were divided in main and control groups. Medication treatment program was identical in both groups, but in the main group progenitor precursors' committing activate plasma flow therapy (Zv. Khelade at all. „New usage of Plasma flow” producer 2008.06.26 #4825) was also used, in particular, sternal bone marrow's plasma irradiation during 10 minutes and 2 times per day was done. Bleeding activity and hemostasis were estimated by Forrest. After repeated endoscopy and histological analysis of biopsy material it was proved that at acute gastro-duodenal ulceration progenitor precursors' committing activate plasma flow therapy considerably improved ulcer cicatrization as compared to control.

**Key words:** acute gastro-duodenal ulceration, gastro-duodenal bleeding, ventilator-dependent critical patient plasma flow treatment, progenitor precursors' committing therapy.

**Actuality**

In ventilator-dependent critical patients acute gastro-duodenal ulceration determines internal hemorrhage in the 50% of cases (8). The developing mechanism of “stress” ulcer is related to the emission of glucocorticoids and catecholamines in the blood, which strengthens acid secretion, it lowers the secretion of the mucous of stomach, and it also destroys local microcirculation in stomach and duodenum. This causes the hemorrhage in the mucous. The mucous surface collapses and the erosions are formed, and from time to time they ingrown and after reaching the muscular tissue of the stomach and duodenum they are formed into ulcers (10). The problem of treating this kind of ulcers is very important for the clinic of critical care medicine, because the gastro-duodenal bleeding that they cause can sometimes be profuse and relatively burdens the condition of critically ill patient (1). From this point of view, controlling of the committing of progenitor precursors might give us some effect, which would improve the repairing processes in the gastro-duodenal tract. The activation of the process of differentiation of stem cells of bone marrow can be generated with the help of the plasma streams (2, 10). Therefore, using the plasma streams in order to strengthen the repairing processes of the “stress” ulcer in the stomach and duodenum for treating the critically ill patients becomes newsworthy.

**Material and methods**

The 48 ventilator-dependent critical patients were prospected who had “stress” ulcers. The cause of development of critical condition was polytrauma, stroke, sepsis and other factors. There were 27 men and 21 women, the age of the patients varied between 32 and 76. All patients were on lung ventilation during 5-30 days on SIMV mode (“Puritan Bennett 7200, USA). The evidences of “stress” ulcers were seen on the 2<sup>nd</sup> or 3<sup>rd</sup> days after patients were hospitalized. The “stress” ulcers were identified with the endoscopic research (apparatus “Olympus GIF Q 30”, Japan) and 2-4 manipulations were performed per

patient, also the histological research of biopsy material was executed. The length of the observation included the whole period of the patient being in the clinic (5-30 days).

The classification of J.A. Forrest (1974) was used to rate the activity of the bleeding and the level of the hemostasis, by which the active arterial bleeding (F-Ia) occurred in the 11 patients, venal (F-Ib) – 14 patients. In 19 cases the defect of the mucous was overlaid with the thrombus (F-II). In 5 cases the bleeding was not detected although melena was designated (F-III).

The methods of conservative and plasma flow therapy were use for treatment. Conservative treatment was represented with anti ulcer (H2-blockators, proton inhibitors, antacides), infusion, hemostatic and hemostimulating therapy: in 35 patients of the main group sternal bone marrow's plasma irradiation during 10 minutes and 2 times per day additionally was done. The plasma stream was cultivated with the help of argon, and the temperature of the stream was 10 000<sup>0</sup>-12 000<sup>0</sup>C (2). There were no recrudescences of bleeding or any other complication while using this method.

The ulcer was located in the stomach in 6 patients and in 17 of them the ulcer was located in duodenum. The ulcer of the stomach, in 4 cases was, located on the small curvative, and in 1 case the ulcer was on the big curvative and one more in the pyloroantral area of the stomach. The ulcer of duodenum was located on the front wall of the duodenum in 8 patients, on the back wall – in 5 patients and on the upper wall of bulb in 4 cases.

In 19 patients out of 23, who had the “stress” ulcers, the size of the diameter of the ulcer was from 0,1sm to 0,5sm, and in the rest 4 patients the ulcer was overlaid with clotted blood.

### **Results and discussion**

The results of the research showed that in the 13 patients of the control group, the ulcers did not cicatrized and by the end of the process they still existed in the 8 patients (61,5%), and the ulcers cicatrized and the ulcers did not exist in 5 patients (38,5%). By the end of the research, in the 35 patients from the main group, the “stress” ulcers thoroughly did not exist in 18 patients (51,1%), in 7 patients (20,0%) their size and amount was significantly reduced, although they were not entirely eradicated. This denoted statistics was verified with the endoscopic research, and also with the histological research of biopsy material. Namely, the stimulation of differentiation of stem cells of marrow caused the acceleration of reparation processes and the cicatrisation of the “stress” ulcers in the patients of the main group. The stimulation of the stem cells of marrow was conditioned with the treatment with the plasma streams.

### **Conclusion**

The use of plasma streams increased the healing process of gastro-duodenal mucous layer and accelerated the cicatrization of the ulcers, which was caused by the plasma streams' influence upon reparative processes of the barrel cells of the bone marrow.

For example we are discussing on of the patient's anamnesis:

Patient M, age – 86 years, was hospitalized on 15<sup>th</sup> of June 2009 with this diagnose: Acute Cerebrovascular Attack. The condition of the patient was critical at the time of hospitalization, and the patient was given 16-20 point when rating by Apache 2, rating by Glasgow Coma Scale – 4-5 points.

Patient was receiving these treatments and medications:

- Mechanical ventilation of the lungs, SIMV mode (breathe volume 6 ml/kg, FiO<sub>2</sub> – 40%)
- anti swelling therapy by Glycerin
- antacids and proton pump inhibitors

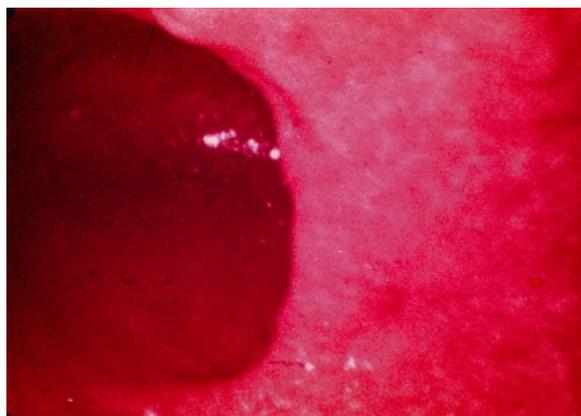
The patient was also receiving parenteral and enteral nutrition and other standard arrangements. On the 3<sup>rd</sup> day the sign of bleeding raise up – a “coffee-ground” blood was received with nasogastric suction. The endoscopic research took place with the help of which we saw: dim mucous membrane, expressed venous bleeding from the erosion of the antrum, on the bottom of which the blood vessel with more than 2mm diameter was discovered (pic. #1), which was covered with a red thrombus (which is II level in the Forrest classification). We also saw fewer than 10 gastric erosions.

**Pic. #1. Bleeding of the gastric erosion, covered with a thrombus.**



After this, a complex treatment was started, which included treatment with plasma rays for 10 days. On the 3<sup>rd</sup> day of the using plasma therapy, the general condition of the patient started to improve, there were no signs of bleeding anymore. On the 10<sup>th</sup> day of this treatment, a repeated endoscopic research took place after which the results were subsequent: the color of the mucous was pink, on the place of the erosion there was a new layer of epithelium, which covered the blood vessel. The signs of bleeding were not seen (pic #2). The patient was extubated and after 12 days treatment was moved to the neurological department.

**Pic. #2 The epithelialized erosion of the mucous layer of the stomach.**



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პლაზმური სხივების გამოყენება კუჭისა და თორმეტგოჯა ნაწლავის მწვავე წყლულების მკურნალობის მიზნით ფილტვების ხელოვნურ ვენტილაციაზე მყოფ ავადმყოფებში. ზ.ხელაძე, ს.ჯაიანი, ბ.ცუცქირიძე, ზ.ხელაძე, დ.ჩახუნაშვილი, გ.ჩახუნაშვილი. კრიტიკული მედიცინის ინსტიტუტი. თბილისი. საქართველო.

48 კრიტიკულ პაციენტს, რომლებიც იმყოფებოდნენ ფილტვების ხელოვნურ ვენტილაციაზე, აღენიშნათ სისხლდენა კუჭსა ან თორმეტგოჯა ნაწლავში მწვავედ განვითარებული წყლულიდან. ავადმყოფები დაეყავით საკონტროლო და ძირითად ჯგუფებად. მწვავე წყლულის მედიკამენტური მკურნალობის სქემა ორივე ჯგუფში იდენტური იყო. ძირითად ჯგუფში დამატებით გამოვიყენეთ მკურნალობა პლაზმური ნაკადით: მკერდის ძვლის ტვინი მუშავდებოდა პლაზმური სხივებით, 5-10 წუთის განმავლობაში, ორჯერ დღეში (ზ.ხელაძე და თანაავტ., პატენტი №4825). მწვავე წყლულიდან სისხლდენის აქტივობის და ჰემოსტაზის ხარისხის შეფასების მიზნით გამოვიყენეთ ფორრესტ-ის კლასიფიკაცია. პლაზმური სხივებით მკურნალობამ ძირითადი ჯგუფის 35 ავადმყოფში მნიშვნელოვნად გააუმჯობესა კუჭსა და 12-გოჯა ნაწლავში სტრესული წყლულის შეხორცების პროცესი საკონტროლო ჯგუფის 13 ავადმყოფთან შედარებით. ეს დადასტურდა ენდოსკოპიითა და ბიოფსიური მასალის ჰისტოლოგიური კვლევით. რეპარაციის დაჩქარება გამოიწვია ძვლის ტვინის ღეროვანი უჯრედების დიფერენციაციის პროცესის გააქტივებამ პლაზმური სხივებით.