

**Review**Vol. 1, Núm. 1 Enero-Marzo 2008  
pp 24-28**Ozonotherapy of the gastrointestinal tract stressinjuries at urgency patients and biocrystalloscopic monitoring of its effectiveness**Peretyagin SP,\* Vorobyov AV,\* Martusevich AK,\*  
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Artemyeva SV,\* Vorobyova IG,\* Bochkareva AV\***ABSTRACT**

Ozonotherapy technology aims at optimization of the burning patients management. One of the most typical syndromes of burn disease is a gastroduodenal ulcer genesis. Complex ozonotherapy courses (intra-gastral, intravenous, biopuncture, cutaneous) bring to a good gastroprotective effect by normalization of the organism's hormone-producing system functioning, particularly by the prostaglandin E<sub>2</sub> activation. The primary diagnostics of the mucous gastroduodenal zone' forming ulcerous defect can be realized by the organisms' substrata biocrystalloscopy technology. Complex ozonotherapy is effective at the burning patients management. It is a method of the gastrointestinal ulcer genesis prophylaxis and treatment. The disease biocrystalloscopic monitoring is very important.

**Key words:** Ozonotherapy, gastroduodenal ulcer, burning patients, biocrystalloscopy.

**RESUMEN**

La tecnología de la ozonoterapia tiene como objetivo el manejo de aquellos pacientes ardiados. Uno de los síndromes más típicos de la enfermedad del ardor es la génesis de una úlcera gastroduodenal. Los cursos de ozonoterapia compleja (intra-gastral, intravenosa, biopuntura, cutánea) nos ofrecen un buen efecto gastroprotector por medio de la normalización del funcionamiento del sistema productor de hormonas del organismo; en particular, a través de la activación de la prostaglandina E<sub>2</sub>. Los diagnósticos primarios de los defectos que forman úlceras en la zona de la mucosa gastrointestinal se pueden realizar por medio de la tecnología de biocrystalloscopia del sustrato de los organismos. La ozonoterapia compleja es efectiva en el manejo de los pacientes con ardores. Ésta es un método de profilaxis y tratamiento de la génesis de la úlcera gastrointestinal. Aquí resulta muy importante el monitoreo biocrystalloscópico de la enfermedad

**Palabras clave:** Ozonoterapia, úlcera gastroduodenal, pacientes con ardores, biocrystalloscopia.

**INTRODUCTION**

The question of the gastrointestinal tract (GIT) stress injuries prophylaxis and treatment is relevant now. GIT stress injuries play an important role in the pathogenesis and outlets of the urgency patients. Early revelation of the

GIT acute damage risk factors allows to start prophylaxis management in proper time. That is why it is necessary to develop new methods of this pathology diagnostics, prophylaxis and treatment. The acute erosive-ulcerous injuries of the GIT mucosa play a special role in the burn disease polysystem dysfunction. They often brings to gas-

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trointestinal haemorrhages which are characterized by the aggravation of the patient's condition and lethality.<sup>14</sup> Emotional stress, central neurohumoral changes, generalized hypoxia, microcirculation disorders and some other factors associated with the thermal trauma aggravate the burn disease pathogenesis. Erosion is the main condition of the acute ulcer genesis mechanisms. It is produced by a strong stream of a pain impulsation and reflex neurohumoral microcirculation dysfunction. These changes lead to a high tissue hypoxia.

Ischemia of the GIT wall is the basic factor of the erosion and ulcer formation. It is caused by the disorder in the submucosal layer microcirculation and verified by the infarction necrosis presence.<sup>5,6</sup> It is showed that many factors play an important role in the stress damage genesis. They are intensification of the sympathetic activity (which inhibits intestinal peristalsis and transforms GIT epithelium endocrinal and paracrin function), intestinal paresis (which aggravate hydro-electrolyte disorders), bacteriaemia, increased excretion of the bioamins and cytokines (which worsen posttraumatic endotoxycosis) by the digestive system cells in blood.<sup>4</sup> This problem takes on special significance when patients have the *Helicobacter pylori*-associated diseases and chronic alcoholism.

Problem of the *Helicobacter pylori* (Hp) infection diagnostics is relevant nowadays. Each of the *Helicobacter pylori* (Hp) determination method has advantages and disadvantages.<sup>13</sup> One of prospective methods is the human biological fluids crystallization diagnostics.<sup>1,9,10,15</sup>

Antacids, gastroprotectors, H<sub>2</sub>-antagonists, proton pump inhibitors, anti-Hp drugs, myogenic spasmolytics, neuro-psychotropics, sodium hypochloride, synthetic analogs of prostaglandin E<sub>1</sub>, laser therapy, hyperbaric oxygenation are used for the prophylactics and treatment of the GIT stress damage, especially associated with the Hp infection.<sup>2,4,7,11,13</sup>

Existent technologies of the stress-initiated gastro-duodenal ulcer correction have a variable effectiveness and are poorly individualized. One of the disadvantages is the difficulty of their prophylactic use. Insertion of the medications with the prostaglandin analogues (such as alprostadil and cytotek) in the complex treatment is one of the prospective ways of the ulcer genesis effective reduction (according the data by Yu.V. Nefedova, 1999).<sup>11</sup> We took out a patent for the prostaglandins endogenous synthesis stimulation technology with the help of the system ozone therapy (so-called autogemotherapy with ozone and this process registration by the blood serum crystalloscopic analysis No. 2307658 "Method of the prostaglandins production in the organism").

We showed that ozone assists the extrication and synthesis de novo of the prostaglandin E<sub>1</sub> which has a pronounced protective effect. The following research of the

alprostadil (as an exogenous analogue of the PGE<sub>1</sub>) and ozonotherapy (aimed at a prostaglandin-stimulated effect) injection effectiveness was done on the comparative groups of the patients with the acute Hp-associated gastroduodenal pathology and showed no reliable distinctions according to the traditional laboratory criteria and biosubstratum tezcristalloscopy. The research showed the effectiveness of the ozone therapy for such patients. Ozonotherapy (local and system – patent No. 2290913 "Prophylaxis and treatment of the GIT stress injuries at patients in the breaking point") brings to the marked analgetic effect and Hp eradication. Besides we can apply these methods to the dynamics control of the treatment effectiveness.

That is why it is necessary to find and work out new technologies of the GIT middle section stress-associated pathology prophylaxis and treatment and express diagnostics of their effectiveness.

Hard injuries and diseases which bring to the GIT ulcer, surface and deep burn of the II-IIIAB-IV degrees, burn and traumatic disease are the *indication* for this technology use.

There are no *contraindication* for the local ozone therapy. Rarely a cut ozone dose and concentration are used at the skin allergic diseases.

There are contraindication for the system ozone therapy: internal and external haemorrhages, marked hypocoagulatory syndrome, haemophilia, thrombocytopenia, hemorrhagic vasculitis, acute cardiac infarction, hemorrhagic stroke, pancreatitis, thyrotoxicosis, individual intolerance to the ozone therapy components.

### **Git ozone prohyllaxis and treatment tecnology at burn disease**

A patient has a treatment from the 2-3 day during 5-7 days in the early posttraumatic period after diagnostic fibro-gastro-duodenoscopy and absence of the GIT haemorrhage. The patient has a morning lavage on an empty stomach with the nasogastric pump injection of 500 mL ozonized physiological solution. The solution is made by the oxygen-ozone mixture barbotage with the ozone concentration 10 mg/L on the generator outlet and the gas stream 1 L/min 1 L of solution is worked up for 20 min, the ozonized physiological solution is injected through the stomach pump which is stopped up after that for 10 min, then the liquid is eliminated from the stomach. Then a monitor's intestines cleaning is carried out, a flowing insufflation is executed through the rectal catheter during 12-15 min with the ozone concentration 150-200 mkg/L and gas stream 250 mL/min. Ozonized physiological solution intravenous infusion is realized during the day with the ozone concentration 3 mg/L, 200 mL per day.<sup>12</sup> Then the ozone-oxygen mixture is

injected hypodermically with the ozone concentration 2,500 mg/L in the back reflexogenic area in the Th<sub>8</sub>-L<sub>2</sub> zone on the paravertebral line. Then the ozonized oil "Otri-ozonid" is applied on this zone and vacuum massage is made here. The patient's state is controlled dynamically by the fibro-gastro-duodenoscopy, observing the antioxidant system (by the bio-chemiluminescence) and repeated organism biosubstrata crystalloscopy (saliva, urine, sometimes stomach mucilage).

### Method of the biofluids teziocrystalloscopy analysis (A.K. Martusevich, 2008)

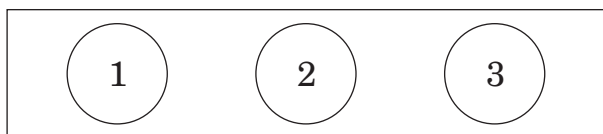
0.3 mL of the biological material samples (blood serum, urine, saliva, sweat, eyewater etc.) are put on the fatness, cleanse and dried object-plate.<sup>1,9,15</sup> The distinction of this method is that the 3 samples are put on the object-plate (Figure 1). The first one (1) includes only biofluid, the second (2) – biofluid and the crystals-forming (basic) substance, the third (3) – the crystals-forming compound control. The basic substance is 0.9% NaCl.

The micro-preparation drying is done in the warm blast. The samples association is inadmissible. After that the crystalloscopic pictures are analyzed on the crystallographic and tezigraphic components separately.

Teziocrystalloscopic analysis technology includes a uniform algorithm with the quantitative indices use. The biofluid crystallizability, presence, quantity and ratio of the sample's crystalline and amorphous substances, micro-preparation zone characteristic, morphology regularity, facia's texture, additional formation are the main indices of the crystallographic and tezigraphic facias.

The GIT crystalloscopic analysis reveals the rules of the saliva and urine crystalloscopic facias of the patients with the stomach and duodenum ulcer. The most important of them are:

1. Indicative structures of the stomach and duodenum ulcer and of the whole gastro-duodenum zone. It is possible to use the tezigraphic and crystalloscopic components for the pathological process vicissitude determination.
2. "pyramid" and "horse-tail" structures are the crystallographic markers of the stomach ulcer (SU), whereas oc-



**Figure 1.** Preparation made according to the teziocrystalloscopic method.

tahedron, linear dendrites, pyramids concentration are characterized for the duodenum ulcer (DU).

3. combination of the octahedrons, pyramids, horse-tail and the main tezigraphic coefficient ( $4.28 \pm 0.50$  for saliva;  $2.34 \pm 0.45$  for urine) show the presence of the microorganisms at the initial helicobacteriosis diagnostics.

### Dynamical control of the ulcer cicatrization effectiveness using clinical and crystalloscopic methods for the biosubstratum analysis.

The medical treatment effectiveness monitoring is also very important. It is realized by the biosubstratum crystallogenic and initiative properties estimation. The active ulcerogenesis is at most differ from the healthy people by the indices values. But the stress-ulcer treatment approximates them to normal.<sup>10</sup>

The system ozonotherapy effectiveness verification is accomplished by the blood serum crystalloscopy revealing second diamond-shaped structures-indicators of the prostaglandin PGE1 after the ozonized physiological solution intravenous injection.

### Results of the ozonotherapy clinical application at the GIT pathology

The worked out ozone therapy method was previously used at the treatment of the 34 patients with the Hp-associated stomach and duodenum ulcer in combination with the anti-Hp medications (de-nol, omeprazolom, metronidazole) for 3 weeks. The ozone total daily doze was 3.0-3.5 mg. There were 37 patients in the control group. They had a standard medical therapy (de-nol, metronidazole, clacid, omeprazolom).

Among 71 patients there were the DU in 56 cases (79.1%) and the SU in 15 cases (20.9%). 66 patients had a pain syndrome (93,6%). 62 patients (88%) had a stomach dyspepsia syndrome. 63 (89%) patients had seasonal exacerbation. The most frequent symptom (93.2%) was morbidity at the epigastric zone palpation. Endoscopically the ulcers were from 0.3 to 1.9 sm.

It was shown that the rate of the disease clinical signs disappearance depended on the cure type. The clinical symptomatology regressed faster (Table I) in the main group (where the ozonotherapy was used) in comparison with the control group.

The pain syndrome was cut short after  $10 \pm 2.1$  days, dyspepsia-after  $7 \pm 1.3$  days in the control group patients. 66.4% of the patients had an ulcer cicatrization after a month. The pain syndrome was cut short after  $3.6 \pm 0.6$  days, dyspepsia-after  $3.3 \pm 0.7$  days in the main group

**Table I.** Clinical symptomatology dynamics at the anti-ulcer therapy in the analyzed groups.

Clinical symptoms	Date of the clinical symptomatology reduction (days, $M \pm m$ )	
	Control	The main group (ozonotherapy)
Pain syndrome	10 $\pm$ 2.1	3.62 $\pm$ 0.6
Heartburn	8 $\pm$ 0.92	2.9 $\pm$ 0.61
Sickness	8.2 $\pm$ 1.2	3.9 $\pm$ 0.8
Vomit	5.6 $\pm$ 0.7	3.2 $\pm$ 0.5
Belch	4.8 $\pm$ 0.8	3.2 $\pm$ 0.6
Heaviness in the stomach after ingestion	6.7 $\pm$ 0.9	4.1 $\pm$ 0.62

patients. 32 (94.42%) patients of the ozonotherapy group recovered entirely, two (5.58%) had an abatement of the ulcer size.

Usually an eradical therapy common standard scheme has side effects. Frequency comparison of the anti-ulcer therapy side effects (*Table II*) in the patients groups showed the advantages of the ozonotherapy treatment.

Ozonotherapy application advances facilities of the complex arrangements for the structural and functional GIT integrity in the thermal trauma treatment.

The effectiveness of the burn disease complex therapy including the ozonotherapy methods into medical treatment is estimated by the clinical manifestation regress dynamics, visual picture at the fibro-gastroscolical analysis and control analysis of blood bio-chemiluminescence. Ulcer cicatrization quickens at the combined ozo-

**Table II.**

Side effects	Control group (standard scheme) n = 37	Main group (ozonotherapy without antibacterial therapy) n = 34
Utricar rash	4 (12%)	No
Skin itch	5 (14%)	1 (2.4%)
Sickness	10 (29%)	4 (12.5%)
Vomit	3 (8%)	2 (5.5%)
Diarrhea	9 (25%)	No
Constipation	16(44%)	5 (14.1%)

notherapy because of the successful combination of the ozonized physiological solution direct bactericidal effect, ozonized physiological solution influence on the reparation processes by the organism oxidative processes activation and micro-circulation improvement in the stomach mucosa.<sup>12</sup>

Our research shows the effectiveness of the anti-ulcer technology based on the medical ozone application. The reflex ozonotherapy inclusion in the medical protocols increases the treatment effectiveness and decreases pharmacological course costs and its side effects. This procedure influences selectively one of the most important etio-pathogenic chains - nerve impulsion from the central and peripheral nervous systems which play a great role in the gastroduodenal peptic ulcer formation.<sup>16</sup>

So we showed that our method of the complex ozonotherapy gives a possibility to do prophylaxis and treatment of the GIT ulcer disorders at urgency patients on the base of a great clinical material.

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