

**METHODOLOGY OF LOCAL AND SYSTEMIC USE OF OZONE-
OXYGEN MIXTURES IN MEDICAL PRACTICE.
THE POTENTIAL USE OF OZONE IN VIRAL INFECTIONS.
OZONE THERAPY TECHNOLOGIES IN
OBSTETRICS AND GYNECOLOGY.
OZONE THERAPY TECHNOLOGIES IN
DERMATOCOSMETOLOGY.**

STATE UNIVERSITY OF MEDICINE AND PHARMACY “NICOLAE TESTEMITANU”

DEPARTMENT OF INTERNAL MEDICINE

THE DISCIPLINE OF GERIATRICS AND OCCUPATIONAL MEDICINE

OPTIONAL COURSE: OZONE THERAPY

SUBJECTS:

- Methodology of local and systemic use of ozone-oxygen mixtures in medical practice.
- The potential use of ozone in viral infections.
- Ozone therapy technologies in obstetrics and gynecology.
- Ozone therapy technologies in dermatocosmetology.

METHODOLOGY OF LOCAL AND SYSTEMIC USE OF OZONE-OXYGEN MIXTURES IN MEDICAL PRACTICE.

- Ozone therapy is used in the form of parenteral and enteral ozone administration, closed-volume aeration (gas bags) and ozone applications.
- Clinical studies have reported very few cases of side effects or complications during procedures.
- Of primary importance is the dose of ozone administered, which does not exceed the potential of antioxidant enzymes. This requirement must be complied with, to prevent the surplus of active forms of oxygen.
- The doses presented were chosen on the experimental basis and on the basis of the clinical studies performed.

OZONE DISTILLED WATER

- Water with ozone/oxygen mixture is made in glass vessels with a concentration of 5 mg/l (O₃/O₂), the duration depending on the volume of ozonized water (3 liters – 30 min., 5 liters – 46 min., 10 liters – 60 min.).
- Ozone water is widely used in surgery and gynecology for irrigation and lavage.
- In gastroenterology it is administered per bone as drinking water in esophagitis, gastritis and ulcers.
- In colitis it is used for clyster procedures.
- In dental practice, ozonated water is administered in the form of gargism (mouthwash) as disinfection of the oral cavity in periodontosis, stomatitis, contaminated wounds and suppuration of the dental canals.
- In otolaryngology, ozonated water is used for inhalation.
- After preparation, the water should be used within 30 minutes.

OZONATED VEGETABLE OIL

Ozone disinfectant properties are well revealed in the use of ozonated vegetable oil.

The oil has been found to have antiseptic activity several hundred times higher than physiological serum.

It is used for oral administration and in the form of ozonated applications.

For ozone we use refined vegetable oil (sunflower, olives, corn, etc.).

The blotting is carried out with different concentrations and durations:

For oral administration 100 ml of oil is ozonized for 10 min with ozone concentration of 20mg/l (O₃/O₂), 5 min – ozone concentration 40mg/l (O₃/O₂).

For external use 100 ml of oil is ozonated for 15 min with an ozone concentration of 20mg/l (O₃/O₂), 30 min – ozone concentration 10mg/l (O₃/O₂).

For external administration in mycosis 100 ml oil is ozonated 15 min with 24mg/l (O₃/O₂) concentration, 8 min – 50mg/l ozone concentration (O₃/O₂).

The ozonated oil should be stored in a dark glass bottle.

According to the latest data, ozonated oil can retain its properties for 4 months when stored at room temperature, when stored in the refrigerator can be used for 2 years

When taken for oral use, it should be started with a teaspoon 20-30 minutes before meals 2-4 times a day, gradually increasing the dose to one tablespoon 2-4 times a day

OZONATED SALINE SOLUTION FOR INTRAVENOUS INFUSIONS

The ozonated saline solution is administered to solve different clinical tasks by using different concentrations ranging from 400 to 100000 mcg/l of ozone/oxygen mixtures at the outlet of the ozone generator.

To achieve a general stimulating metabolic effect, we use the simultaneous saturation method and intravenous infusion of physiological saline solution.

The ozone concentration is 40 mcg per kg of body weight,

(e.g. the patient weight is 80 kg, so the ozone concentration is $40 \times 80 = 3200$ mcg at the ozone generator output.)

Physiological saline saturation can be achieved as follows:

The ozone/oxygen mixture is passed through a 200 ml flask for 10 minutes, then the saline solution is infused intravenously for 15-30 minutes.

INTRODUCTION OF THE OZONE/OXYGEN MIXTURE IN THE GAS PHASE

This method provides analgesic, anti-inflammatory and stimulant effect. Subcutaneous and intracutaneous injections are made in painful points and acupuncture, 1 ml per each; for microinjections of focal lesions we use 5-10ml with ozone concentration -10 mg/l.

In periarticular microinjections we use 1-3ml with concentration-10-15mg/l

Intramuscular injections are made with 10-20ml, the concentration is 10-15 mg/l.

Intraarticular injections are made with the concentration

- 15mg/l and volume of 1-1.5ml for **minor joints**
- 5-7ml for **medium joints**
- 20 ml for **major joints.**

RECTAL INSUFFATIONS WITH OZONE/OXYGEN MIXTURE

Procedures are done with the Janet syringe or with the help of a special polyclinic-vinyl tube with a patient positioned on the left side with bent knees.

Purgative enema is done two hours before the procedure. Rectal insufflations are made with the ozone/oxygen mixture concentration of 10-60mg/l, the volume varies from 150ml to 1000 ml, depending on the pathology, its course and stage. For newborns the volume is 20-50ml, for children –50-100ml.

Intestinal insufflations can be given, first of all, as an anti-inflammatory and disinfectant, remedy for restoring unbalanced bacterial flora by pathogenic microorganisms.



Secondly, it can be administered as an alternative to major autohemotherapy, since the ozone/oxygen mixture being absorbed instantly produces general metabolic effect. This procedure can be applied to those cases when intravenous injections are difficult to manage.

The usual therapeutic dose to produce metabolic effect is 75 mcg per 1 kg of patient weight, for example for a 80 kg patient the ozone dose should be $75 \times 80 = 6000$ mcg. The course of treatment is started with half a dose and a minimum volume of ozone/oxygen mixture (150-200 ml), which is gradually increased to the required dose.



VAGINAL INSUFFLATION WITH OZONE/OXYGEN MIXTURES

Vaginal insufflations are made with ozone concentration of 2-2.5 mg/l in ozone/oxygen mixtures, with gas flow – 0.5-1l/min for 5-10 minutes.

The procedures are done with special nozzles placed on vaginal speculation.

Vacuum aspiration is mandatory to prevent the formation of the inhalation effect on the patient and doctor.

MINOR AUTOHEMOTHERAPY WITH OZONE/OXYGEN MIXTURES

Minor autohemotherapy with ozone/oxygen mixtures is used to produce a stimulating effect in conditions with immune deficiency.

The procedure is simple and easy to perform.

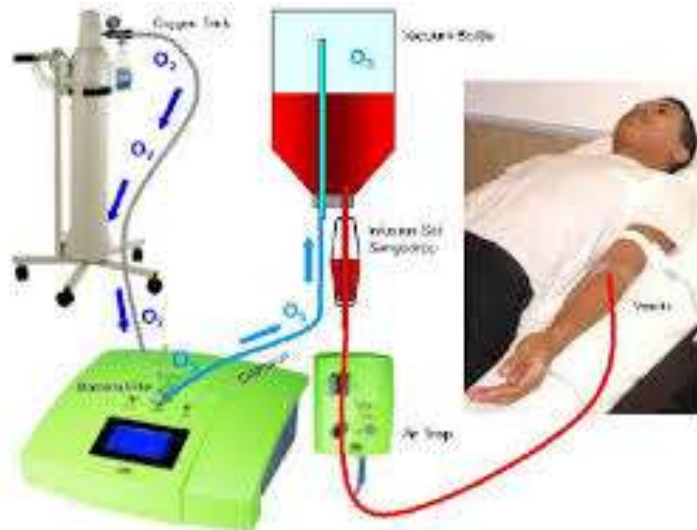
Venous blood (5-10 ml) is collected in a 20 ml syringe with 10 ml of ozone/oxygen mixture, ozone concentration –10-40 mg/l and carefully mixed, then injected intramuscularly.



MAJOR AUTOHEMOTHERAPY WITH OZONE/OXYGEN MIXTURES

For major autohemotherapy we use a balloon or a special plastic bag with anticoagulant and fill it with 50-150ml of venous blood taken from the patient.

The blood is mixed with ozone/oxygen mixture, the ozone concentration should not exceed 40 mg/l (higher concentrations of ozone can lead to hemolysis) is returned to the patient intravenously.



According to practical instructions, ozone in doses of 6-10 mg produces immunosuppressive effect and should be administered in active cases of rheumatism and rheumatic arthritis.

In atherosclerotic diseases of the cardio-vascular system, in septic surgery and in chronic diseases requiring immunostimulatory treatment the recommended dose of ozone is 1-3 mg, in rare cases 4 mg.

Ozone doses of 8-9 mg are administered at the acute stage of infectious hepatitis, which is gradually increased to 2.0-0.8 mg with remission of exacerbation, similar doses are used in herpes infection.



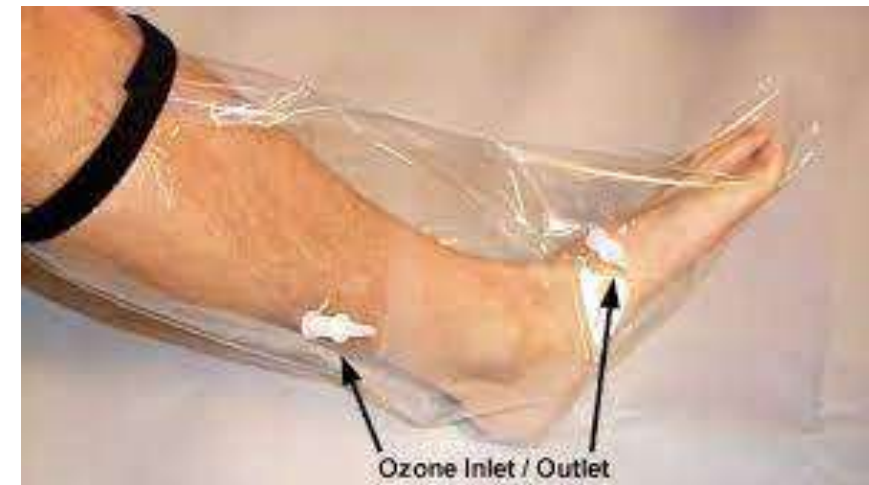
OZONE AERATED PLASTIC BAG

The method has proven to be very effective in the treatment of trophic ulcers, purulent wounds, sores, painful cicartics, burns and defects caused by seizure of superficial and subcutaneous tumors.

Before the procedure, the affected leg is moistened with water or saline solution and then a hermetically dressed and closed plastic bag. The bag is filled with gas mixture until excessive pressure is reached.

Then a destructor is turned on.

Ventilation is done for 15-20 minutes.



In patients with vascular disease when the skin surface is not affected, the ozone concentration is 6-8ml/l ozone/oxygen mixture.

In cases of trophic ulcers or purulent wounds, the affected area should be covered with dressing soaked in saline or distilled water.

The initial ozone concentration is 5-6mg/l.

At the granulation stage the concentration is reduced to 1-1.2 mg/l.



NOTE!

It is known that ozone in low concentrations produces a moderate hypo-coagulation effect, so all drugs that decrease blood clotting (anticoagulants, aspirin, etc.) should be discontinued during ozone therapy.

In women, the course of treatment should be interrupted for menstrual periods.

THE POTENTIAL USE OF OZONE IN VIRAL INFECTIONS

Ozone therapy is a unique method of treatment with an ozone-oxygen mixture, in which oxygen is additionally introduced into the body.

At the same time, unlike many antiseptics, ozone does not have a destructive and irritating effect on tissues, because human cells have a powerful antioxidant defense system.

In the body, ozone acts in several ways:

- If he encounters viruses in a free state, he destroys them.
- If the virus is in the cell, then ozone creates the conditions for its destruction by the cell itself.
- It protects healthy cells from getting the virus into them.

DIRECT ANTIVIRAL ACTIVITY

- Distortion of virions by direct contact with ozone, which destroys the membrane with multiple double bonds, vulnerable to the oxidizing action of ozone, lesions that do not allow their survival and reproduction;
- Ozone alters the glycoprotein structures by which viruses attach to host cells, which prevents the adhesion and penetration of viruses into the cell;



INDIRECT ANTIVIRAL ACTIVITY

- Immunomodulatory action, by activating the specific and non-specific defense system, cellular and humoral immunity;
- Anti-inflammatory effect, restores metabolic processes in affected tissues at the site of inflammation, corrects pH and electrolyte balance;
- The pro-/antioxidant system optimizer, restores the dynamic balance between the level of peroxidic oxidation products and antioxidant defense systems
- Blood circulation optimizer, in the microcirculatory bed (flow, vasodilation, correction of metabolism and erythrocytic resistance major O₂ partial pressure);



INDIRECT ANTIVIRAL ACTIVITY

- Revitalizing, regenerating effect;
- Detoxifying effect - by activating the microsomal system of hepatocytes and intensifying renal filtration;
- Activates oxygen-dependent metabolic processes in hypoxic states (acceleration of glycolysis, reduction of the content of metabolites oxidized in plasma, improvement of microcirculation and reological properties of blood, antihypoxic mechanisms, improvement of tissue energy metabolism, increase of repair quality of mutations).

OZONE THERAPY TECHNOLOGIES IN OBSTETRICS AND GYNECOLOGY.

Waylines:

- Intravenous infusions with ozonated saline.
- Rectal insufflations with ozone/oxygen mixture.
- Major autohemotherapy, the ozone dose being 1-3 mg.
- Intrauterine irrigation with ozonated distilled water.
- Treatment consists of intravenous infusions with ozonated saline or rectal infusions with ozone/oxygen mixture.
- Both can be replaced with major autohemotherapy.
- Daily infusions with 200-400 ml of ozonated saline solution, ozone concentration/oxygen mixture at the outlet of the ozone generator being 1200 μ g/l is done for 5 to 7 days.

Rectal insufflations with ozone/oxygen mixture are performed according to the accepted method and calculated based on $75 \mu\text{g}/\text{kg}$ of patient weight.

The gas volume is from 300 to 600 ml with ozone concentration of 10-40 mg/l.

Major autohemotherapy is done twice a week with a total number of procedures up to 4-6.

Intrauterine irrigation with ozonated distilled water (400ml) with an ozone concentration of 4-5mg/l are made to ensure full contact with the site of inflammation and to exclude any damage to the mucous membrane in various forms of endometritis.

Ozonated water is introduced into the uterine cavity through the biluminal catheter and then discharged through the same catheter. The procedure can be repeated 3 times during a session, which is done once a day.

In combination with basic anti-inflammatory therapy, the cleaning of the described uterus is restored to prevent generalization of the inflammatory process, thus shortening the course of treatment.

INFLAMMATORY DISEASES OF THE GENITAL TRACT

Vaginal irrigation with ozonated saline with a volume of up to 1 liter and ozone concentration of 6-10mg/l is carried out daily (8-10 procedures per course) and completed with applications with ozonated oil (1-2 times daily).

These procedures can be replaced by vaginal insufflations with ozone/oxygen mixtures, i.e. they are performed daily in 5-8 days.

Using a special nozzle for vaginal speculum, the ozone concentration is 1.5-2.5mg/l, it is inserted into the vagina.

Before the insufflation procedure, the vagina is washed with distilled water for 5-10 minutes at a flow rate of 0.5-1L/min.

Gynecology

The use of ozone therapy produces a positive effect on clinical evolution in conditions such as the risk of miscarriage, gestosis, pregnancy anemia, delay in intrauterine growth and the risk of complications in obesity.

It is related to the immune corrector and the antioxidant of ozone. Improved oxygen intake, reology and microcirculation help stimulate hormone secretion.

ABORTION. EARLY TOXICOSIS

Application:

- Intravenous infusions with ozonated saline.
- Major autohemotherapy, the ozone dose being 0.4-0.5 mg.
- Daily infusions of 400 ml of ozonated saline solution, ozone concentration in the ozone/oxygen mixture being 400µg/l, are made for 5 days.
- Ozone therapy is found to be most effective at the end of the first and beginning of the second trimester of pregnancy.
- Major autohemotherapy is done twice a week with a total number of procedures up to 4-6.

GESTATIONAL TOXICOSIS. ANEMIA OF PREGNANCY

Application:

- Intravenous infusions with ozonated saline
- Major autohemotherapy, the ozone dose being 0.4-0.5 mg.
- Daily infusions of 200 ml of ozonated saline solution, ozone concentration being 400µg/l, are made for 5 days.
- Ozone therapy is found to be most effective in mild and moderate gestosis.
- Major autosemotherapy is done twice a week with a total number of procedures up to 4-6.33

Note. Ozone therapy is contraindicated in bleeding of the genital tract of different intensity and can be instituted only after their complete cessation.

Intrauterine infection

Treatment of pregnant women who are at risk for fetal infection is carried out in the second trimester of pregnancy.

Application:

Intravenous infusions of ozonated saline

- Major autohemotherapy, ozone dose is 0.4-0.5 mg.

Daily infusions of 200 ml of ozonated saline solution, ozone concentration in the 800µg/l ozone/oxygen mixture are made for 6 days.

Major autohemotherapy is done twice a week with a total number of procedures up to 4-6.

OZONE THERAPY TECHNOLOGIES IN DERMATOCOSMETOLOGY.

The use of ozone therapy in the management of patients with various skin inflammations makes it possible to delineate inflammation and improve trophic processes.

Of 495 patients undergoing ozone therapy, a complete disappearance of the clinical picture or significant improvements were observed in patients with

- dermatosis and herpes (100%);
- pyoderma (95%);
- eczema (75%);
- neurodermatitis (66%) and psoriasis (60%).

NEURODERMITITIS. ECZEMA

Application:

Intravenous infusions of ozonized saline or rectal infusions with ozone/oxygen mixtures or major autohemotherapy, as well as ozonized vegetable oil, aeration with ozone/oxygen mixture in a plastic bag.

The course consists of 10-12 procedures of intravenous infusions with ozonized saline or rectal infusions with ozone/oxygen mixtures performed every two days.

Major autohemotherapy is done twice a week up to 5-6 procedures.

Ozonized vegetable oil is applied to the injured surface twice a day for 20 minutes until the eruptions disappear.

The aeration course consists of 5-8 procedures, performed every second day for 20 minutes with the ozone concentration being 5-20mg/l.



ACNE

Application:

Minor autohemotherapy

- Major autohemotherapy

- Ozonated vegetable oil

In mild cases (isolated eruptions):

Minor autohemotherapy is administered up to 8-10 procedures performed every second day.

In severe cases (massive eruption):

Major autosemotherapy is indicated up to 8-10 procedures done twice a week.

Ozonized vegetable oil should be applied to the injured surface twice a day for 20 minutes.

Applications must be made until the eruption disappears.

FURUNCULOSIS

Application:

Major autohemotherapy

Minor autohemotherapy

Intravenous infusions with ozonated saline

Subcutaneous microinjections with ozone/oxygen mixture around the hotspot inflammation

The course of treatment begins with major autohemotherapy, up to 5 procedures performed every second day, followed by intravenous infusions with ozonized physiological serum alternating with minor autohemotherapy (6-8 procedures). Microinjections around the outbreak of inflammation should be done every day until the furuncle breaks.

HERPES

Application:

Major autohemotherapy.

Minor autohemotherapy.

Ozonated vegetable oil.

The course of treatment includes 10-15 minor autosemotherapy procedures performed every two days and 4 major autosemotherapy procedures performed once a week.

The ozonized oil is applied twice a day on the dry elements until the papules break.



PSORIAZIS

Application:

Intravenous infusions of ozonated saline or rectal infusions with ozone/oxygen mixtures.

Major autohemotherapy/ Minor autohemotherapy.

Ozonized vegetable oil.

Intravenous infusions with ozonated saline or rectal infusions with ozone/oxygen mixtures are performed every two days up to 10 procedures.

Minor autosemotherapy includes 6 procedures performed twice a week. Instead of intravenous infusions with ozonized physiological serum, rectal ozone/oxygenation infusions can also be done minor autosemotherapy and a major autosemotherapy course.

The first two procedures are to be performed every second day, the remaining procedures are done twice a week.

Ozonated vegetable oil should be applied to the injured surface twice a day for 20 minutes for one month.



MICOSIS

Application:

Ozonated vegetable oil.

Minor autohemotherapy.

The treatment consists of ozonated pads applied to the nails twice a day for 30-40 minutes for a period of 3-6 months for the nails in the hands and 6-9 months for the nails in the feet.

Every three months a major autohemotherapy course of 3-6 procedures is performed.

Before treatment



After treatment









Trophic ulcers



Post-interventional ligature fistula



Psoriasis





before



after

Thank you!