Ozonized Saline solution
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This method was **formalized by the Ministry of Health of the Russian Federation** in the early 80s therefore, has been **officially implemented in public health hospitals**, specifically for the branches of orthopedics, dermatology, gynecology and obstetrics. In 2001th it was also officialized in Ukraine. Besides, Russians have a massive amount of articles and published clinical experimentation, along with a strong clinical experience about the benefits of this therapy. At the same time they have more than 500 doctoral theses in ozonetherapy using ozonized saline solution.

Let me make a reflexion, since when the West is the owner of the only and the last truth in science? Russia has a large and proven scientific background at all scientific levels, this is unquestionable. The statement made in your forum “*In occidental scientific journals, or at least those published in English I have never found a paper supporting the use of ozonized saline.*”

Ironically this argument reminds me the report issued by the Ministry of Health and the Agency for Health Technology Assessment of Andalusia and Galicia (Spain) "Clinical effectiveness of ozone interventions" Reports, studies and research from 2008 that was sent to us in response to our request of regularization the therapy in Spain. In this "study" they said. "*Most of the studies analyzed in this report are developed in Italy (around 55%), which could be explained by the strong presence of this technology in that country. Other countries (Cuba, Russia Germany.) have done work that are not represented in this report, either by being published in not indexed journals or have been excluded by the language used. “P. 45*

The decision that was taken then was done skewing the largest source of scientific information coming from Cuba, Germany and Russia. Exactly what this person argues against the saline solution. When a person considers the achievements of others only through the prism of marketing, then sooner or later people will begin to raise reasonable doubts seeing which their real intentions are. Unfortunately behind this “debate” are the commercial interests of those who sell the bottles for autohemotherapy and disguise their interests with pseudo science.

Saline solution is not only **safe and effective**, but it solves the big problem we face with the different health administrations worldwide. In the places where autohemotherapy is viewed with skepticism, saline goes unnoticed. In those patient that due to their religion do not accept the manipulation of blood, the saline is the solution again, and on top of this, it is much **cheaper** than AHTMajor.

Now regarding the saline solution itself. The use of ozonated saline compels to ask two questions: 1. If the mixture of ozone with saline generates H2O2 and NaCl substrates that may cause complications in the body, and 2. If the dose of ozone that the patient receive with this procedure is sufficient to obtain an appropriate therapeutic response.
To the 1st question, I answer based on the following data:
I allow myself to take the data from the Russian presentation at the Turkish Congress in 2011. From the graph above shown, clearly we can see that in the preparation of the saline solution with ozone at a concentration of 50 µg/mL during 10 min the level of hydrogen peroxide formed rises up to 2.5 g/mL. Is this much or little? A simple calculation shows that in weight units, the concentration of hydrogen peroxide comprises 85 µg/mL <0.00001%.
It is clear that the concentration of hydrogen peroxide and the sodium chloride is not conspicuous or even noteworthy.

According to research made by Professor Claudia N. Kontorshchikova:
In ozonated 0.9% saline solution (0.55mg/L of O3) on average were found 0.004 mM/L of chloride ions.
There were not registered presence of NO3- and no significant differences in concentration compared to the control sample analyzed after ozonation.

Analysis of hydrogen peroxide in samples of 0.9% NaCl solution and in the ozonated water, made by methods of analytical chemistry, revealed no accumulation of hydrogen peroxide in concentrations exceeding 0.002% in any of the ozonation schemes, although they found even much lower concentrations, on the order of 0.0004%

At that same time prof Razumovski stated “the descomposition of ozone in aqueous solutions of NACL is not accompanied by formation of products other than oxygen. In particular, no noticeable amounts of hypochlorites and chlorates are observed. This particularly significant for medicinal application of ozonized isotonic solutions”.

These Russian chemist showed that the concentration of sodium hypochlorite in the ozonated saline was less than 0.001 g/mL.

To the question whether it is a suitable therapy the use of ozonated saline solution in the treatment of various diseases, question that seems more interesting and more important to me, it is necessary to take into account the dose of ozone that the patient should be given in the proceeding of intravenous administration of saline.

The ozonation is carried out at very low concentrations of ozone and these are calculated according to patient weight.

As a rule, in the Russian method, the concentrations used ranging between 1 and 3 mg/L. With these figures the patient receives 0.2-0.6 mg/L of ozonated saline sol. You can easily calculate that the ozone dose the patient receives is 0.2-0.6 mg or 0.4-1.2 mg. Thus, the question of if it is effective or not the Russian method, the right question is whether the ozone dose of 0.2-1.2 mg. for the treatment of diseases that ozone therapy usually treat are effective or not.

For some diseases, like the autoimmunes, these doses are insufficient. In these cases is most appropriate to apply the major autohemotherapy because what we need is high suppressive doses. Nevertheless, there is a huge list of diseases for which the Russian method is entirely appropriate. As an example, are the good results of the doctoral thesis at the Odessa University called "The use of ozone therapy in the rehabilitation of patients with ischemic cardiovascular diseases." Dr. A. V. Artiomenko, Odessa, 2004.

Which physical law applied to ozonized saline solution?

**Henry's Law** which states that a gas is dissolved in a liquid (at constant temperature) in direct proportion to its pressure (either partially or not). If we speak of partial pressures then it is assumed that the gas is a mixture of two or more gases.

If we introduce in a bottle, a pure water and oxygen at 1 bar, this gas dissolves in water up to saturation. If we increase the pressure, oxygen begins to dissolve again until the new level of saturation. Thus, the amount of gas is dissolved directly proportional to the pressure.

If a mixed gas, let say, air, containing 21% oxygen and 79% nitrogen then this gas dissolve in relation to their partial pressures, that is, 1 bar of air pressure, and 0,21bar corresponding to oxygen and 0,79bar to the nitrogen (Dalton's Law).

Henry's statement refers to inorganic liquids and not to organics fluids as blood.

Blood is an organic living fluid and ozone immediately reacts with biomolecules such as uric acid, unsaturated fatty acids, etc. resulting the production of metabolites as hydrogen peroxide, lipid peroxides, ozonides, etc. these are its messengers that act in an indirect way in the body.

The mixture of ozone and blood should not be done by bubbling. The reason is basically that the bubble will cause damage to the erythrocyte, although small but unnecessary. The low volume of gas exiting the micro bubble diffuser, when enter in contact with the blood, which is at a relatively high temperature, will transform part of the ozone in oxygen reducing the effectiveness of any MAHT process.

Ozone reacts with the blood per unit surface area making the mixture gentle with less damage to the erythrocytes. Therefore, the bottles have inside a cannula for introducing the ozone without bubbling and remains inside the bottle, part of gas and another with
blood. The method of placing the bottle horizontally and swing the mixture in about 4-5 min it is most effective.

**What is the quantity of blood processes by ozone in Major AHT and IV Saline Solution?**

If we take into account:

- The speed of the flow of blood in the cubital vein which is (0.1 – 0.2) L/min,
- The time that procedure takes = 30 min,
- The volume of ozonized blood,

\[(0.1-0.2) \text{L/min} \times 30 \text{min} = 3-6 \text{ L of blood} \]

The difference between the infusion of saline solution and the major AHMT is that by saline solution a greater amount of blood is being treated. Since the SSO is a plasma expander, therefore, SSO3 represents 15% times more than major AHMT. Perhaps this is the crucial point of the effectiveness of the Russian method.

Regarding the mutagenicity, same thing is happening with AHTMajor studies and the organism can deal with it perfectly.

Now we know (since 2011) that ozone trigger the Nrf2 system with the final formation of antioxidant proteins at the nucleus level. Well, this recent studies has been done with AHTMajor and with Ozonized Saline Solution and the results are exactly the same. Nrf2, via activation of EpRE, regulates the expression of proteins that collectively favor cell survival.

Nrf2 system contributes to protection against various pathologies, including carcinogenesis, liver toxicity, respiratory and chronic inflammatory diseases, neuronal ischemia and renal problems and this can be achieved either way: with AHTMajor or with ozonized saline solution.

- Qu et al., 2011. ozonized saline activation of the Keap1-Nrf2- EpRE signaling pathway rat's liver injury induced by CCI4.