



A POSSIBLE SOLUTION TO EBOLA: OZONE THERAPY

Proposal submitted by IMEOF (International Medical Ozone Federation) to WHO, health authorities, medical NGOs and religious congregations working with Ebola patients

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The proposal is divided into three parts

1. Introduction and presentation of the problem
2. Proposal of IMEOF
3. Brief scientific analysis of the ability of ozone to treat Ebola

Introduction and presentation of the problem

The presence of Ebola

The world is shocked by the news from Africa in relation to the Ebola virus. The number of patients in the current epidemic is above 6500 and the death toll is higher than 3000 in the most affected countries which are Liberia, Sierra Leone and Guinea, (figures released by WHO on September 30, 2014¹).

In a study published last September 24, 2014 by WHO in the New England Journal of Medicine² “the cumulative number of confirmed and probable cases” by beginning of November would increase to more than 20,000 cases, surpassing the previous WHO estimates. These data indicates that if drastic control measures are not introduced sooner, the number of cases and deaths from Ebola will continue to grow from hundreds to thousands per week in the coming months.

¹ <http://www.who.int/csr/disease/ebola/en/>

² Ebola Response Team. Ebola virus disease in West Africa: the first 9 months of the epidemic and forward projects. N Engl J Med 23 Sep 2014, doi: <http://www.nejm.org/doi/full/10.1056/NEJMoa1411100>



WHO position: To apply treatments which still are being tested.

In a desperate measure, on August 11, 2014, the WHO (World Health Organization) convened a panel of experts (over 200 people) to analyze the option of using experimental treatments. The panel concluded “In the particular context of the current Ebola outbreak in West Africa, it is ethically acceptable to offer unproven interventions that have shown promising results in the laboratory and in animal models but have not yet been evaluated for safety and efficacy in humans as potential treatment or prevention.”³

WHO accepted the conclusion of the expert panel and convened for the following month a meeting with 200 professionals to identify experimental vaccines and treatments that may be most useful in combating Ebola.⁴

Authorizing the use of untested vaccines and treatments to treat patients with Ebola hemorrhagic fever is a big step that WHO has just taken. The logic here must be to save lives and contain the spread of the disease which constitute a high priority.

Challenge we are facing

However, we face a major challenge: If they were indeed useful for saving lives, large amounts of these experimental drugs are not and will not be readily available, as stated by some of the drug companies involved. Therefore, the effectiveness of these drugs to control the spread of the disease in the short term should be seriously questioned.

Currently, Ebola is only active on the African continent, but constitutes a threat to global health, as there is a danger that may expand elsewhere by people traveling to areas at risk and return to their countries without being aware that they are incubating the disease, as has just occurred on Tuesday September 30, 2014 in Dallas (USA)⁵ with a traveler who gave positive testing for the Ebola virus, constituting the first case diagnosed in the United States. Because of this situation 50 individuals are under quarantine. On October 6, it was learned that a nurse

³ Ethical considerations for use of unregistered interventions for Ebola viral disease. Report of an advisory panel to WHO. WHO/HIS/KER/GHE/14.1

⁴ Following that advice, WHO convened (from 4–5 September) a consultation on potential Ebola therapies and vaccines. <http://www.who.int/mediacentre/news/ebola/26-september-2014/en/>
<http://www.elnuevoherald.com/noticias/estados-unidos/article2354658.html#storylink=cpy>

⁵ http://internacional.elpais.com/internacional/2014/09/30/actualidad/1412111015_357706.html



at the Madrid Carlos III Hospital who had been in contact with an Ebola patient had been infected. ⁶

Note that:

1. The virus is one of the deadliest that can infect humans, with a mortality rate between 83 and 90% (in the epidemic of 2002-2003).
2. There is no cure or vaccine against it (at least recognized by the dominant medical dogma).
3. Countries primarily affected by this epidemic have large marginalized populations, and health care systems "simply do not have the capacity to handle an outbreak of this size and complexity on their own ...", as stated recently by a spokesman of Medicine without Borders.

On this basis IMEOF is proposing to WHO, health authorities, medical NGOs and religious congregations working with Ebola patients the possibility to include ozone therapy in the current medical treatments used to fight Ebola.

Ozone therapy is an absolutely safe treatment, ⁷ which stimulates and modulates the immune system, which after a few cycles of treatment, the immune system is able to turn the balance and control the infection with no side effects for the patient, and that has helped many patients to control chronic viral infections such as hepatitis C, herpes, HPV, HIV, the virus Chikungunya and many others. It is a treatment which has been successfully used. It has scientific support ⁸ which backs its application with minimal secondary or nonexistent side effects. This treatment has easy and simple implementation that could be readily available in large quantities at low cost, even in the poorest areas of the world, which now could save thousands of lives and help to contain the epidemic.

⁶ <http://www.elmundo.es/espana/2014/10/07/54339ab0ca47411a098b456c.html>

⁷ Schwartz A. et al. La ozonoterapia y su fundamentación científica. Rev. Española de ozonoterapia. La Ozonoterapia y su fundamentación científica. Revista Española de Ozonoterapia. Vol. 2, nº 1, pp. 163-198. <http://www.xn--revistaespaoladeozonoterapia-7xc.es/index.php/reo/article/view/23>

Schwartz A. et al. Ozone Therapy and Its Scientific Foundations. Spanish Journal of Ozone Therapy. Vol. 2, nº 1, pp. 199-232. <http://www.xn--revistaespaoladeozonoterapia-7xc.es/index.php/reo/article/view/27/30>

⁸ Schwartz A. et al. La ozonoterapia y su fundamentación científica. Rev. Española de ozonoterapia. La Ozonoterapia y su fundamentación científica. Revista Española de Ozonoterapia. Vol. 2, nº 1, pp. 163-198. <http://www.xn--revistaespaoladeozonoterapia-7xc.es/index.php/reo/article/view/23>

Schwartz A. et al. Ozone Therapy and Its Scientific Foundations. Spanish Journal of Ozone Therapy. Vol. 2, nº 1, pp. 199-232. <http://www.xn--revistaespaoladeozonoterapia-7xc.es/index.php/reo/article/view/27/30>



Why there is no more information about medical ozone?

Ozone is a very unstable gas that cannot be packaged or stored, so it has to be generated in situ at the time of its application. This is one of the main reasons why this treatment is not available in this international emergency. If medical ozone could be packaged, it would have been sold at exorbitant prices in pharmacies. The inability to bottle it makes that the pharmaceutical companies do not have control over the therapy. This is the main reason why most of the world has been kept in the dark about the benefits of medical ozone. It cannot be patented, it is present in nature and is produced by the same organism (by neutrophils), and therefore it is not in the interest of the pharmaceutical companies to implement ozone therapy due to the great monetary loss which could signify for them.

Routes of application of ozone

There are various routes of therapeutic administration of ozone (O₃): Major Autohemotherapy, ozonated saline solution and rectal insufflation.⁹

In the case of Ebola infection, the rectal insufflation¹⁰ is the method of choice to apply immunomodulatory therapy, as it prevents and minimizes the risks to the health personnel of the repeated veno-puncture at the moment of administering it. It is a simple, feasible and practically free of side effects as long as the doses are correct. It has been demonstrated the low toxicity effect of rectal insufflation in experimentally, clinical and preclinical studies.

The only routes of administration of ozone that are absolutely prohibited, are inhalation (toxic to the respiratory tract) and direct intravenous due to the risk of air embolism.¹¹

⁹ Madrid Declaration on Ozone Therapy, 2010, Document signed by 40 national and international associations of ozone therapy so far; it is translated into 12 languages. www.aepromo.org, www.imeof.org, www.isco3.org

¹⁰ Gregorio Martínez-Sánchez et al. Rectal administration and its application in ozonotherapy. International Journal of Ozone Research (11):1, April 2012 - 41-49. <http://www.internationaljournalofozonotherapy.it/rivista.aspx?ID=361>

¹¹ Madrid Declaration on Ozone Therapy, 2010, Document signed by 40 national and international associations of ozone therapy so far; it is translated into 12 languages. www.aepromo.org, www.imeof.org, www.isco3.org



In the immunological context it has been proven that rectal insufflation of ozone¹² can dramatically influence the lymphoid tissue associated with the digestive tract mucosa. Rectal insufflation with oxygen / ozone is one of the oldest forms of application of ozone therapy. The evidence existing at the present of the results of studies in both animals and humans, has shown that this route may be used as a systemic therapeutic approach safely.

It has been observed that in the colon-rectal mucosa of rabbits that received ozone rectally, O₃ immediately dissolves in the water overlying epithelia and reacts with the feces, mucoproteins and other biomolecules present, generating H₂O₂ and POL.¹³

The POL, H₂O₂ and oxygen pass through the muscles and are absorbed via the lymphatic and venous capillaries, reach the liver and enter the general circulation. This has allowed it to be considered a viable alternative for Major Autohemotherapy (MAHY), indicated for the treatment of hepatitis B and C and the immunostimulating therapy systemically.¹⁴

PROPOSAL OF IMEOF

WHO should include ozone therapy in its policies to deal with Ébola; health authorities, medical NGOs and religious congregations working with Ebola patients to include ozone therapy in their treatments.

It should be borne in mind that ozone therapy is a "medical act" and can only be performed by trained health professionals and act according to previously established protocols.

Implementation of the proposal

Protocol. The treatment protocol will be provided by IMEOF.

¹² Gregorio Martínez-Sánchez et al. Rectal administration and its application in ozonotherapy. International Journal of Ozone Research (11):1, April 2012 - 41-49.

<http://www.internationaljournalofozonotherapy.it/rivista.aspx?ID=361>

¹³ Bocci V, Borrelli, E, Corradeshi F, Valacchi, G. Systemic effects after colorectal insufflation of oxygen-ozone in rabbits. Int J Med Biol Environ.2000; 28: 109-13.

¹⁴ Madrid Declaration on Ozone Therapy, 2010, Document signed by 40 national and international associations of ozone therapy so far; it is translated into 12 languages. www.aepromo.org, www.imeof.org, www.isco3.org

Bocci V, Borrelli, E, Corradeshi F, Valacchi, G. Systemic effects after colorectal insufflation of oxygen-ozone in rabbits. Int J Med Biol Environ.2000; 28: 109-13.



Training. Massive training of doctors, nurses and auxiliary health personnel in ozone therapy techniques to allow its implementation in a fast, safe and effective way. Medical ozone would be administered through rectal insufflation. This technique would allow its massive and safety use and at low economic cost.

Trainers. IMEOF is able to provide various specialized professionals who willingly would impart training in countries infected by Ebola.

Time course. Each course would be two days long. In a week it could be organized accordingly up to three courses. Depending on the number of trainers, ozone generators and participants, it could be organized parallel courses of 50 participants each one.

Venue. The courses would take place in venues provided by the organizations involved and if necessary they could be made in open field, under the condition to have electricity because is required by the ozone equipment.

Logistic of the courses. Organizations that accept the proposal, would be responsible for the overall organization of the courses, which include: Travel expenses of trainers (at least 4), accommodation, food and per diem; transportation cost of equipment; translators if necessary, as well as ensuring the customs clearance of equipment.

Ozone generators. They are portable, powered by electricity and source of medical oxygen (oxygen tanks). At least two generators for courses and the first applications will be contributed by different specialized companies. IMEOF through AEPROMO would deploy efforts so that the equipment could be provided for free.

For the treatment massive implementation WHO, health authorities, medical NGOs and religious congregations should make arrangements directly with purchasing companies supplying ozone generators.

THE BRIEF SCIENTIFIC ANALYSIS OF THE ABILITY OF OZONE TO TREAT EBOLA

The antiviral activity of ozone, includes capsid damage, oxidation of the lipid envelope, changes in the structure that prevent receptor binding and penetration into a new cell. The antiviral action is observable in lower concentrations than in the bactericidal. This is because the viruses have less structural complexity in the wall membranes than in the bacteria.

Inside the body the virucidal and bactericidal capacity of O₃ is achieved by stimulating the immune system and not by the direct attack of the microorganism. The ozone has immunomodulatory action, since it is able to modulate the immune response by stimulating



the activity of leukocytes and the production of cytokines, interferons and TNF- α . The H₂O₂ formed after decomposition, enhances the body's defense capability.¹⁵

The ozone action on the immune cell is compared with the effect caused by mitogens. In citocinetic induction of immunocompetent cells, the lymphocytes CD4 + T (cooperators, helpers,) activated by macrophages produce cytokines that initiate intercellular communication in their role as messengers. The IL-2 released by these cells, is responsible for the activation and differentiation of the T cell, activation of natural killer cells (NK) (spontaneous cytotoxic) induce cytotoxicity of CD8 + T cells and promotes the activation and proliferation of B cells, hence these cells are considered a mainstay in the cell-mediated immune response. Thus, the activated CD4 + T lymphocytes trigger a complete cascade of immune reactions.¹⁶

Activation of CD8 + T cells, macrophages, neutrophils, eosinophils, NK cells and the activation of cell cytotoxicity depending of antibody, establish immune effector mechanisms to destroy virus-infected cells, tumor cells or kill bacteria and parasites.¹⁷

In appropriate dosage, ozone is an inducer of IFN α , FNT α , IL-2 and IL-6, which have antibacterial and antiviral activity and does not cause cell damage.

Another aspect of interest of the ozone as an immunomodulator during controlled "microoxidación" that occurs after its administration whose "vaccine effect", is the induction of a favorable activation response of the antioxidant systems. The ozone has a controlled oxidative effect that stimulates and regulates the activities of antioxidant enzymes:

¹⁵ Bocci V. Ozonation of blood for the therapy of viral disease and immunodeficiencies. A hypothesis. Medical hypothesis 1992 Sep; 39(1): 30-4.

¹⁶ Arencibia JR, Leyva Y, Collymore A, Araujo JA. Producción científica sobre aplicaciones terapéuticas del ozono en el Web of Science. ACIMED [revista en la Internet]. 2006 Feb; 14(1): Disponible en: http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S1024-94352006000100007&lng=es

¹⁷ Arencibia JR, Leyva Y, Collymore A, Araujo JA. Producción científica sobre aplicaciones terapéuticas del ozono en el Web of Science. ACIMED [revista en la Internet]. 2006 Feb; 14(1): Disponible en: http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S1024-94352006000100007&lng=es

Menéndez S. Mecanismos de acción biológica y efectos terapéuticos del ozono. En: Menéndez S, González R, Ladea OE, Hernández F, León OS, Díaz M. Ozono: Aspectos Básicos y Aplicaciones Clínicas. 1ra Ed. La Habana: CENIC; 2008. p. 4-107.

Li Q, Verma IM, . Nf-kB regulation in the immune system. Nat Rev Immunol. 2002 Oct; 2(10): 725-34.



glutathione reductase, glutathione peroxidase, superoxide dismutase, catalasa. From reactive oxygen species (ROS), H_2O_2 is the most important metabolite or derivative ozone oxidant, which as essential messenger, regulates signal transduction and biological effects of ozone, including the immune system.¹⁸

From interaction of ozone with fatty acid and lipid generates products of lipid oxidation (POL) which are also responsible for chemical messages to cells. Induction of cellular glutathione, hemo oxygenase 1 and heat shock proteins are some of the ways in which the POL induce antioxidant activity.¹⁹

Medical ozone can be used as a drug with general regulatory activity, which exerts its effects by stabilizing the cellular redox balance. The POL and the H_2O_2 generated by the decomposition of ozone act as signaling molecules in stress which improves cellular energy balance and immune system for the benefit of numerous diseases. It is considered by many authors as a drug capable of modifying the biological response by the multiplicity of action and the generation of intermolecular signaling.²⁰

It has been proven the effectiveness of ozone therapy (OT) to modulate the immune system to induce the production of cytokines from mononuclear cells and regulating blood oxidative stress by stimulation of antioxidant systems. It is known that in the acquired immunodeficiency syndrome chronic oxidative stress occurs, therefore, the antioxidant system of defense is altered. There is also a decrease in the levels of ascorbic acid, tocopherols, carotene, selenium, superoxide dismutase and reduced glutathione; elevated levels of malon hydroperoxides and aldehydes and severe effects on the inflammatory

¹⁸ Bocci V, Borelli E, Travagli V, Zanardi I. The ozone paradox: ozone is a strong oxidant as well as a medical drug. *Med Res Rev.* 2009; 29: 646-82.

Travagli V, Zanardi I, Silviotti A, Bocci V. A physicochemical investigation on the effects of ozone on blood. *Int J Biol Macromol.* 2007; 41: 504-11.

¹⁹ Bocci V. Scientific and medical aspects of ozone therapy. State of the art. *Arch Med Res* 2006; 37: 425-35.

²⁰ Menéndez S. Propiedades terapéuticas del ozono. *Rev. Cubana Farmacia* 2002; 36(2):189-91.

Bocci V, Zanardi D M, Travagli V. Mechanisms of action and chemical-biological interactions between ozone and body compartments: a critical appraisal of the different administration routes. *Current Drug Therapy* 2009, 4: 159-73.



response in lymphocyte proliferation and apoptosis. In this syndrome was observed (at different researches) a decrease in viral load by more than a third, and increased values of CD4 + lymphocytes after therapy of ozone.²¹

**We can make possible a better world with the help of all!
WHITH YOUR HELP, YES WE CAN!**

**Dr. Adriana Schwartz
President of IMEOF /AEPROMO
Madrid, October 7, 2014**

²¹ Garber, GE, Cameron DW. «The Use of Ozone-Treated Blood in the Therapy of Hiv-Infection and Immune Disease - a Pilot-Study of Safety and Efficacy.» Aids 1991; 5(8): 981-84.

Madrid Declaration on Ozone Therapy, 2010, Document signed by 40 national and international associations of ozone therapy so far; it is translated into 12 languages. www.aepromo.org, www.imeof.org, www.isco3.org

VV, Zanardei I, Silvietti A, Bocci V. A physicochemical investigation on the effect of ozone on blood. Intern. J. Biol. Macromol 2007; 41: 504-11.