

Chapter 11

The Still Uncertain Future of Ozone Therapy in Medicine

In this final chapter, I will try to ponder the future of ozone therapy. The potent disinfectant activity of ozone against anaerobic bacteria was utilized during World War I but, for the next six decades, there was no progress, which came only thanks to a few clinicians, who believed in its usefulness. A major advance came with the work of Dr. H. Wolff (1927–1980) and an Austrian surgeon, Dr. O. Rokitansky, who, in an empirical way, showed the efficacy of the ozonated autohaemotherapy in often avoiding limb amputation in patients with chronic limb ischemia. However the lack of basic research and randomized clinical trials relegated ozone therapy in the field of complementary medicine with a few and nebulous ideas of how ozone could act.

Meantime, three negative aspects came about: **the first was the general awareness that ozone is a strong oxidant and a toxic gas for the respiratory tract never to be breathed.**

The second was the relevance of free radicals as determinants of ageing and of several human diseases and the knowledge that ozone is a master generator of free radicals. Even today this remains the easy objection raised by scientists and physicians, who do not know the progress that has been made with the biochemistry and pharmacology of either ROS and ozone therapy. Indeed there is now consensus in the physiological role of ROS as crucial signals for cell proliferation and differentiation. While everyday a human body hydrolyzes about 130 mol of ATP (or about the staggering amount of almost 70 kg!), it remains uncertain the amount of hydrogen peroxide physiologically produced in the body to assolve fundamental metabolic and defensive functions. Thus our ozone dose is only a minute but useful fraction added to help the organism!

The third problem arose with the spread of HIV and AIDS infection due to the lack of an appropriate therapeutic control until 1996 when, at long last, virologists understood the need to attack simultaneously the virus with a combination of different drugs (the HAART). In the early 90s, quacks around the world began to inject the gas mixture oxygen-ozone directly into the blood stream, naively believing to disinfect blood, like dirty water flowing in an aqueduct. What is worse is that they exploited the desperate patients and claimed to “cure” the infection hiding the deleterious effect of the pulmonary embolism and possibly of a few deaths. It was easy and correct for orthodox medicine to condemn ozone therapy and these

unforgivable mistakes did almost entomb ozone therapy. However in Cuba, owing to the embargo and lacks of medical drugs, by sheer necessity, a group of enterprising physicians started to use ozone in several diseases confirming that ozone could be medically useful.

By pure serendipity, in 1988, we started our project and we tried to unravel the mechanisms of action when ozone dissolves in blood, hoping to explain the controversy between the too many opponents and the few proponents of ozone therapy. It has not been an easy job but we have started to see a faint light at the end of the tunnel. We were and are well aware of the intrinsic toxicity of ozone: any chemical compound can be a drug or a toxin and we realized the importance to differentiate the therapeutic dose from the toxic one. **Today we have clearly ascertained that OZONE RAPIDLY DISSOLVES in the water of plasma and biological fluids, IMMEDIATELY REACTS WITH BIOMOLECULES, GENERATES CRUCIAL MESSENGERS AND DISAPPEARS.** We know that the ozone-ROS-LOPs signalling cascade is not yet definitive and some aspects remains to be elucidated but it is clear that, among complementary approaches, **ozone therapy has emerged as the one that is well explainable with classical biochemical, physiological and pharmacological knowledge.** After more than 20 years, I feel that confused and wrong ideas have been dispelled and **this book presents the real first comprehensive framework for understanding and recommending ozone therapy.**

Since 1992, we wanted to start clinical investigations and we realized how the scepticism and diffidence against ozone therapy was diffused in the academic world. The FDA, for several good reasons, had to prohibit the use of ozone in the USA. However, one reason was and still is based on the dogma that **“ozone is always toxic and should not be used in medicine”**. *This is an absurd and antiscientific idea and today we have a million reasons for saying that it is totally wrong.* It is disappointing that some influential American scientists still BELIEVE that is correct. The FDA decision has negatively influenced the Health Authorities of other countries and this fact is not surprising because today only a few super-developed countries have a dominant (and not necessarily always positive) influence over the world's medical resources. The FDA has proved several times to be wrong in giving permission to sell drugs to trusting patients. However Russian, Chinese, Cuban use ozonotherapy in public hospitals and recently Spanish Health Authorities have already permitted ozonotherapy in six communities. In Germany, this approach is performed only by private physicians within complementary medicine. In France and England it remains practically unknown.

I still have to answer the question of the future of ozone therapy in medicine. As slowly we move on and explore this approach in new diseases, we are surprised to note the breadth of action of ozone and the lack of toxicity against the blackest prediction. Unfortunately lack of resources and of an efficient international organisation impede a rapid progress of basic and clinical researches. However the discovery that, paradoxically, ozone therapy can induce an adaptation to the chronic oxidative stress by upregulating the antioxidant system, and favour the release of oxidative stress proteins and probably of staminal cells suggest that ozone

exerts multiform activities and has the capability of restoring health by reactivating wrecked biological functions.

As far as therapeutic activity is concerned (concisely summarized in the general conclusions of Chapter 9), it is a complex matter and there are relevant differences depending on the type of pathology. Indeed, against the sarcastic comment that ozone therapy is a *panacea*, we have clear evidence that for several diseases, ozone therapy represents only a useful approach, which must be combined with conventional therapy to achieve the best results. Moreover, as it was expected, **ozone therapy has failed to yield a result in HIV-AIDS, cancer, retinitis pigmentosa, and tinnitus. This is a good opportunity for making a plea for exerting maximal objectivity and honesty:** the competent ozonetherapist must present all possible options to the patient, who has the right to choose the treatment when she/he is fully informed about pros and cons of both conventional and orthodox treatments. Sheldon (2004) reported that the Netherlands, a very liberal and democratic nation, will crack down on six practitioners of complementary medicine after government health inspectors severely criticised the treatments offered to the brilliant actress Sylvia Millecam, who died of breast cancer. Apparently, although mainstream care was available, it seems that Sylvia was abducted to receive electroacupuncture, faith healing, salt therapy and psychic healing instead of a more appropriate therapy that may have procured a cure or a prolonged survival. Ozone therapy has been in the past already defamed with the label of dangerous quackery and today we do not want to deserve that label.

On the other hand, ozone therapy is extremely valid, often more than orthodox treatments, in vascular ischaemic diseases (caused by atherosclerosis, diabetes, uremia, smoking, etc.) and for HEALING chronic wounds, bed sores, chronic ulcers (the diabetic foot), burn injuries, intractable fistulae and an array of skin, mouth, vaginal and rectal infections. Ozone therapy is the only treatment that can restore some visual acuity in patients with the atrophic form of age-related macular degeneration. For all of these affections, ozone is a real “wonder” drug and it is even more wonderful because free of adverse effects and actually capable of generating a feeling of wellness and euphoria. Ironically, the highest percentage of patients with these diseases lives in countries obstructing ozone therapy.

I am absolutely convinced that **the combination of parenteral ozone therapy carried out, when necessary, with the topical one (ozonated water and oil), in due time, will mark a medical revolution.** It remains difficult to foresee when it will happen because the pace of our research, in comparison to official medicine supported by colossal fundings, is too slow.

William James brilliantly described three famous phases characterizing new theories. It appears unavoidable that these blunders occur, from time to time, in the Sciences:

- (1) The new theory is attacked and declared absurd. We are at this phase!
- (2) Then it is admitted that it is true and OBVIOUS, but insignificant.
- (3) To the end, it is recognized the real importance and its detractors demand the honour to have discovered it.

We should not get discouraged and continue to work in spite of the antagonism and negligence of Health Authorities. I regret to say that prestigious scientific journals (FRBM and NEJM) have not given me the chance of opening a dialogue. Recently, the still uncertain novelty that ozone may be produced in vivo and be responsible for atherosclerosis has been amply divulged but **my first letter stating that “ozone is NOT always toxic” was not published until Toxicology and Applied Pharmacology published my paper in 2006.** Similarly the **WHO Bulletin**, which should be responsible for health care of everyone, **has just rejected one of my recent reviews, where, provocatively, I discussed: “Why WHO does not promote the use of ozone therapy”?**

The antagonism of Health Authorities is responsible for delaying the application of ozone therapy to billion of patients and we must do the maximal effort to break this situation. It may seem absurd but there is a hope that oxygen-ozone therapy will quickly extend in all the hospitals of poor or less developed countries before being recognized as a valid tool by the most advanced nations.