

# It is time to integrate conventional therapy by ozone therapy in type-2 diabetes patients

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We read the article written by Gregg *et al.* [2014] (1). It is an excellent paper and describes that rates of type-2 diabetes related complications have deeply declined during the last fifteen years in spite of a tripled increase of the number of diabetic patients. The reduction of acute myocardial infarction, stroke, amputation and end-stage renal disease are certainly due to an improved clinical care, performance of the healthcare system, and patient education in disease management. A far more effective glycemic control, the use of statins as well as coronary revascularization have been the most critical factors but nonetheless acute myocardial infarction, death from hyperglycemia, stroke and amputation the frequency of which halved remain the most stubborn affections dominated by a chronic oxidative stress. This is due to an increased production of reactive oxygen species (ROS), a decreased GSH synthesis, a decreased antioxidant system, production of phase 2 enzymes and HO-1 incapable of neutralizing the excess of oxidants (2).

Although orthodox medicine disposes of excellent drugs, they cannot re-establish a normal redox system because these drugs are not able to reactivate the cellular antioxidant system. In order to interrupt this vicious circle, we propose that now it is time to integrate orthodox medicine with ozone therapy. During the last two decades we have clarified all the biochemical, pharmacological, and molecular aspects of this procedure which is absolutely free of side effects due to the minimal dosages of ozone acting as a prodrug and to the mechanism of action of the ozone messengers. In detail, the latter are hydrogen peroxide and alkenal adducts transferred to billions of cells of the organism able to upregulate the antioxidant system and to normalize the redox system (3,4). The activation of the Nrf2 protein and the upregulation of the synthesis of some 220 genes allow the enzymatic activation of the defence system in all organs.

Type-2 diabetes, even if treated with good orthodox drugs, induces a micro- and macro-vascular dysfunction

leading to a great number of complications. By considering the diabetic epidemiology and the need to fully correct the complex dysfunction, it appears urgent to integrate orthodox medications with ozone therapy (5). One treatment weekly performed for several years may definitively improve the diabetic patient recovery.

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