

Application of Ozone in Heart Diseases

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Abstract - Rapid changing in life style such as change in food habits, complexity in living has resumed no. of diseases in human being. The conventional method of treating these diseases is not effective. Hence no. of alternatives therapies comes into existence. Ozone therapy is one such method that comes into light from last decades. Priming result obtained has being observed with application of ozone particularly in the treatments of wounds heart diseases cancer, HIV. An attempt has been much in the paper to evaluate the effectiveness and feasibility of ozone application for the curing of Heart diseases.

Key words - Heart attack, ozone therapy, heart failure, vessels, arteries, Cholesterol

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INTRODUCTION

Ozone and oxygen therapy is one of the most powerful and versatile therapies known today. Research shows that action of ozone has beneficial effects on every part and organ. Some of the effects are bacterial, fungal and viral inactivation, circulatory enhancement, disruption of tumor metabolism, and stimulation of oxygen metabolism.

Medical ozone is differs from atmospheric ozone in that it is pure and concentrated this is an important distinction because atmospheric ozone produced from UV radiation is combined with different nitrous oxide and sulphur dioxide products and is harmful. It's not used in medical practice.

Ozone therapy has shown positive results in treatment of heart diseases. "Post-bypass or angioplasty, there are chances of a re-block, it is at this point that ozone therapy can be used to prevent a block.

Ozone therapy involves release of singlet oxygen containing powerful antioxidant enzymes which stimulates metabolism and the immune system. It causes red blood cells (RBCs) to release more active oxygen at the tissue level. It relaxes blood vessel cells, opens up small capillaries and improves circulation, killing all sorts of bacteria, virus and fungi. It burns toxins and provides more oxygen to cells.

During First World War (1915) ozone gas was used to purify the drinking water of major cities. .electrically ozone is oxygen with a higher energy level. It is unstable and high reactive. When a patient present with one of the most common forms of Cardiovascular disease coronary heart diseases. We can think that a patient who very likely a tissue that is hungry for oxygen and nutrients. Because the heart is composed primarily of cardiac muscle tissue that continuously contracts and relaxes, it must have a constant supply of oxygen and nutrients. The coronary arteries are the network of blood vessels that carry oxygen-and nutrient-rich blood to the cardiac muscle tissue.

Just like branches on a tree, the coronary arteries branch into progressively smaller vessels. The larger vessels travel along the surface of the heart; however, the smaller branches penetrate the heart muscle. The smallest branches, called capillaries, are so narrow that the red blood cells must travel in single file. In the capillaries, the red blood cells provide oxygen and nutrients to the cardiac muscle tissue and bond with carbon dioxide and other metabolic waste products, taking them away from the heart for disposal through the lungs, kidneys and liver.

When cholesterol plaque accumulates to the point of blocking the flow of blood through a coronary artery, the cardiac muscle tissue fed by the coronary artery

beyond the point of the blockage is deprived of oxygen and nutrients. This area of cardiac muscle tissue ceases to function properly. The condition when a coronary artery becomes blocked causing damage to the cardiac muscle tissue it serves is called a myocardial infarction or heart attack. Heart attacks occur most often as a result of a condition called coronary artery disease (CAD). In CAD, a fatty material called plaque (plak) builds up over many years on the inside walls of the coronary arteries (the arteries that supply blood and oxygen to your heart). Eventually, an area of plaque can rupture, causing a blood clot to form on the surface of the plaque. If the clot becomes large enough, it can mostly or completely block the flow of oxygen-rich blood to the part of the heart muscle fed by the artery. During a heart attack, if the blockage in the coronary artery isn't treated quickly, the heart muscle will begin to die and be replaced by scar tissue.

LITERATURE REVIEW

Yusuf et al., 2004: Cardiovascular diseases, comprising coronary artery (CAD) and cerebrovascular diseases, are currently the leading cause of death globally, accounting for 21.9% of total deaths, and are projected to increase to 26.3% by 2030. The factors that coalesce to increase the risk of developing atherosclerotic CAD were demonstrated and have subsequently been shown to be pervasive across ethnicities and regions all over the world.

Bocci et al, 2011: Ozone administered in an appropriate dose interval can modulate many biochemical pathways with the activation of second messengers. The therapeutic effects of O₃ are dose-dependent. Further, obtaining an appropriate concentration of the ozonation products is crucial to avoid toxicity.

Mustafa, 1990: Adverse effects occur when ozonation products overwhelm the antioxidant system, ultimately resulting in a toxic effect that leads to tissue damage. Its mechanisms of toxicity can be summarized into the following categories.

- Formation of free radicals and reactive intermediates;
- Initiation of lipid peroxidation chain reactions
- Oxidative loss of functional groups and activities of biomolecules, including enzymes;
- Alteration of membrane permeability and functions;
- Initiation of secondary processes.

Re et al., 2008: O₃ regulates the generation of nitric oxide (NO), a powerful chemical mediator that can control several biological functions, such as that of the vascular endothelium. The exposure of rat

macrophages and type II cells to O₃ causes NO production by inducible NO synthase induction.

Medical ozone therapy (OT) is a distinct therapeutic modality which depends on the administration of a gas mixture comprising ozone and oxygen to body fluids and cavities. The ozone/oxygen mixture was reported to exhibit various effects on the immune system, such as the modulation of phagocytic activity.

Bocci VA 2006 : OT also mediated its action via oxidative products. After being administered, ozone dissolves in biological fluids such as plasma, lymph and urine; and immediately reacts with polyunsaturated fatty acids, antioxidants, reduced glutathione and albumin resulting in formation of lipid peroxidation products and H₂O₂. While H₂O₂ acts as an early and short-acting messenger, lipid peroxidation products were distributed to the tissues via circulation and become late and long-lasting messengers. This process stimulates the innate immune system and helps the cell to survive when an injury occurs.

CASE STUDY

We select a patient who have a problem relating to coronary artery diseases, we give proper orientation There are several modalities but the most precise, where ozone and blood antioxidants can really stoichiometrically react is ozone therapy, under the form of a major autohemotherapy. The procedure consists in 2-3 weekly intravenous reinfusion of 200-250 ml of the patient's blood mixed with an equal volume of a gas mixture composed of medical grade oxygen (~96%) and ozone (equivalent to progressively increasing ozone doses just five minutes after gently mixing the gas mixture with blood). We have adopted the strategy of slowly increasing the ozone dose from 4-5 mg up to 16-20 mg (200-250 ml of blood, respectively) to gradually improve the adaptation to the ozone stress. Thus, ozone induces a calibrated acute oxidative stress during which a number of well defined messengers (H₂O₂, 4-hydroxynonenal) interact with blood and parenchymal cells and induce the up regulation of antioxidant enzymes and HO-1. In India medical treatment is very big problem and very expensive so ozone therapy is welcomed by such country due to inexpensive. Recent studies to clarify the mechanism of action have shown that can be exploited in medicine. Exposure of human blood providing exposure times and concentrations are appropriate. Indeed unlike the respiratory system, human blood, the components of which are in a highly dynamic state, it able to neutralize the oxidizing power of ozone by a potent defense system. These compounds are highly reactive and have a short half-life. Moreover, during per oxidation of plasma lipids, there occurs formation of late effectors denominated lipid Oxidation Products (LOPs)... ROS are also produced by the body during cell respiration by mitochondria and during bacterial

phagocytosis by leucocytes. Most of the dose of ozone that comes into contact with blood is partly reduced by hydrosoluble antioxidants and partly transformed into ROS and LOPS, which are also checked by the antioxidant system of the body before they can damage blood cells. The oxidizing action of ozone leads to the formation of hydrogen peroxide that enters cells with various effects : in red blood cells it shifts the hemoglobin dissociation curve to the right and facilitates release of oxygen ; in leucocytes and endothelial cells it favors releases of growth factors ; in all cells it stimulates long term efficiency of antioxidant systems in adaptation to its oxidant action. We have seen exciting result in treatment with ozone therapy. We examine result on a 45 year old woman; we give the treatment of ozone in every 3 days. Following result obtain The practice of autohemotherapy is some 40 years old .we observe there is interesting change in bad cholesterol level in patient and we have great excitement to represent this ,after ozone treatment blood PH will come to normal level .Result before and after ozone treatment are as follows

Lipid profile	Before ozone therapy	After ozone therapy
TOTAL LIPID	650	600
SERUM TRIGLYCERIDES	171	140
SERUM CHOLESTEROL	228	192
LDL CHOLESTEROL	153.8	116
HDL CHOLESTEROL	40	48
LDL/HDL RATIO	3.84	2.41

There is decrease in cholesterol but not in good cholesterol. This is very important result because every value in normal state after ozone treatment

CONCLUSION

It can be used as a preventative measure as we are all literally oxygen starved. It is said that during evolution of the human body there was 38% oxygen in the atmosphere, now there is only 17% and sometimes only 11% in polluted cities. Hence actually a person never really gets enough oxygen to properly saturate the healthy cells and to rid the body of toxins and we are all suffering from hypoxia. We concluded that Ozone gives more oxygen to Red Blood Cells and increases their glucose uptake. It makes tissue cell membranes more elastic, pliable and healthy. It helps cells to intake nutrients efficiently and throws out

waste products quickly. It relaxes blood vessels, capillaries and increases circulation.

The present work in the field of Medical science and develop the ozone therapy for treatment .of diseases. Although much remains to be done, ozone therapy is now amenable to scientific scrutiny and attention should be concentrated on the following points:

- Accurate dosimeter of O₃ concentration
- Standardization of the procedure for O₃AHT
- Further understanding of biological effects, particularly oxidative stress adaptation;
- Evaluation of any possible long-term toxicity
- Evaluation of novel approaches and routes of O₃ administration
- Definition of optimal O₃ dose in different pathological conditions
- Randomized, double-blind clinical studies using either O₂-O₃ or O₂ alone versus conventional treatment, with assessment of long-term follow up;

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