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Major Autohaemotherapy Reduced Free Radical Content and MDA of Heavy Smoker

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Abstract: ***The dangers of smoking on body health have been studied and proven by many researchers. High levels of free radicals in the blood of active smokers can trigger various diseases that are harmful to the body, such as emphysema and lung cancer. To avoid the diseases, the body requires intake of antioxidants from outside the body that can be obtained from food or vitamin supplementation. The therapy is a medical ozone therapy that uses ozone gas which is obtained from mixing pure oxygen and ozone gas. This study is an experimental study using a pre-test post-test control group design that is carried out on male smokers aged 30 to 50 years. The procedure of the study was subjects divided into 2 groups where the first group amounted to 8 people received ozone therapy 10 times with an interval of 1 week, the second group amounted to 8 people were controls who received placebo 1 cc injection of NaCl IV, as much as 10 times, with interval of 1 week. Blood free radical levels and MDA were examined in both groups at the beginning and end of the study with the FORM tool. The results showed a decrease in free radical levels in the blood in the group that was given major ozone. The results of the study using a comparison test after being given a treatment (posttest) between the two groups with the t-independent test, found that the average level of free radicals in the blood with a FORM tool, the control group was 419.75±113.47, and the ozone therapy group 40 µg / ml was 311.00±39.17 (p <0.05). The mean MDA level of the control group was 0.046±0.006, the mean of the ozone therapy group 40 µg / ml was 0.038±0.005. Significance analysis with the t-independent test showed that there were significant differences (p <0.05). Based on the results of the study, showed a significant decrease in free radicals in the blood both measured by the value of FORT and MDA levels in the P1 group who were given ozone therapy 40 µg / ml for 10 weeks.***

Keywords: Ozone therapy, heavy smokers, free radicals, oxidative damage

1. Introduction

Cigarettes are things that are familiar to us. Smoking has become a very common habit in population. Researcher have been studied and proven about the dangers of smoking on health. Smoking increases the risk of cardiovascular diseases (heart disease, vascular disorders, hypertension, etc.), cancers (lung cancer, laryngeal cancer, oral cancer, esophageal cancer, etc.), bronchitis, and reproductive diseases (disorders of pregnancy, impotence and fetal defects). This is due to the large content of free radicals in cigarettes which will damage important biomolecules in the body such as DNA. The hazard components of smoking are ammonia, formalin, nitrogen oxides, hydroxyic acid, and carbon monoxide. The particles also consist of indole, tar, carbazole, cresol and nicotine. These substances are toxic because they cause inflammatory and free radical effects, causing proliferation and activation of phagocytes in the lungs and throughout the body which can reduce the antioxidant effect [1]. High levels of free radicals in the blood of active smokers can trigger various diseases that are harmful to the body so that this is related to the emergence of various diseases in a smoker, such as emphysema and lung cancer [2]. Naturally the body can produce antioxidants. But as we get older, the body's ability to produce natural antioxidants will diminish and eventually causes oxidative stress. This is a condition where free radicals in the body exceed the body's capacity to neutralize it. As a result the intensity of the oxidation process of normal body cells becomes higher and causes more damage. Premature aging and chronic diseases such as cancer, heart disease, Alzheimer's, and others are mainly caused by oxidative stress [3]. To inhibit the aging process and reduce oxidative stress, adequate and optimal intake of antioxidants is needed [4], where antioxidants work by inhibiting oxidation and reacting with free radicals to form non-reactive free radicals which is relatively stable [5].There are two kinds of antioxidants in our body, namely endogenous antioxidants which consist of enzymes and various compounds that can be produced by the body such as Super Oxide Dismutase (SOD), Gluthation Peroxidase (GPx), and Catalase (Cat). Ozone therapy is a cheap, easy to work but has many benefits, for this reason, ozone therapy is widely used in Germany and Russia.

There are a number of methods for administering ozone therapy including ozone minor therapy, intravenous injection of ozoneated saline solution, rectal insufflation, intramuscular injection, use of ozonated oil, use of ozonated water and major ozone therapy (Autohaemotheraphy). Major ozone therapy (AHT), hereinafter referred to as ozone therapy, is a therapy by flowing venous blood from the body into the blood bag and then administering ozone gas according to the therapeutic dose and flowing back to the body [6]. This therapy will activate the work of endogenous antioxidants, increase the release of O2 into the tissues, also an increase in the immune system, which is needed by the body to inhibit the aging process [4]. Therefore, ozone therapy can be used in the field of anti-aging. There are a number of methods for administering ozone therapy including ozone minor therapy, intravenous injection of ozoneated saline solution, rectal insufflation, intramuscular injection, use of ozonated oil, use of ozonated water and

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2. Material and Methods

2.1 Major autohaemotherapy

Blood is flowed into a 50cc blood bag, then ozone is given 40µg / ml of blood, then, the blood in the blood bag that has been given ozone is mixed slowly by means of a blood bag placed on the palm of the hand, then the palm is turned slowly to form the number 8, so that the blood and ozone can be mixed completely, this is done for about 30 seconds, then the blood is put back into the patient's body at a drip rate of 60-80 tts / min.

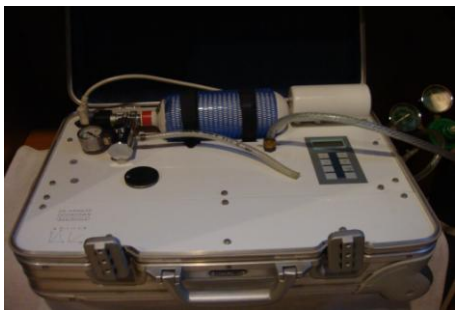

Figure 1: Ozone Generator

2.2 Sample

The study was conducted on male smokers aged 30 years to 50 years because at the age of 30 years it is usually found a decrease in the body's metabolism due to decreased levels of hormones in the body and degenerative processes have begun to occur [4]. Smoking habits will worsen this condition. The upper age limit is set at 50 years, because at this age it is expected that there have not been any damage which has further aggravated the conditions of oxidative stress. Subjects were divided into 2 treatment groups where the first group of 8 people received medical ozone therapy 10 times conducted at intervals of 1 week, while the second group which also amounted to 8 people were control who received IV CC 1 injection placebo therapy, which was done 10 times, with an interval of 1 week. The choice of administration of NaCl so as not to affect the increase in antioxidant levels in the body.

2.3 Free Radical Examination

At the beginning of the study, blood free radical levels were measured, using a blood radical measuring instrument FORM by: blood drawn from the tips of the fingers using a lancet of 0.5 cc, then flowed into a 20µl capillary tube, inserted in a reagent tube, gently shaking, until the blood in the capillary tube is mixed with reagent R2, pour this solution into the R1 reagent tube, then dizzy for 1 minute, after which the tube is placed in a free radical diagnostic tool, and wait for 6 minutes until the results are obtained.

2.4 Statistic

The data obtained then analyzed with independent T-Test by using SPSS 16.0.

3. Results

In addition to using the FORT unit value to determine free radicals in the blood MDA levels are also measured. The results of the analysis with the independent t-test showed that the mean MDA level before treatment in the control group was 0.044±0.005, the mean of the treatment group was 0.047±0.006. Significance analysis with t-independent test shows that there is no difference (p> 0.05).

Whereas after the mean treatment of MDA levels the control group was 0.046±0.006, the mean of the therapy group was 0.038±0.005. Significance analysis with the t-independent test showed that there were significant differences (p <0.05) [7].

Based on the results of the study above, showed a significant decrease in free radicals in the blood both measured by the value of FORT and MDA levels in the P1 group given treatment for 10 weeks. This is because ozone therapy can activate endogenous antioxidants in the body namely Superoxid Dismutase, Glutathione peroxidase, Catalase [8].

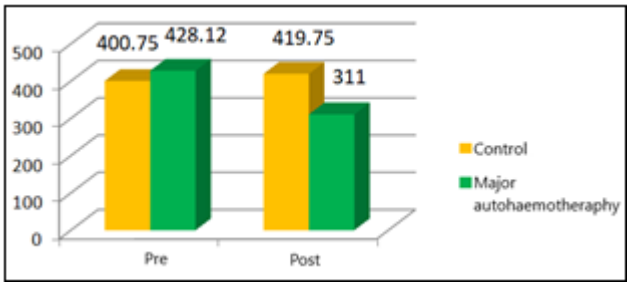

Figure 2: Free Radical Content between Control Group and Treatment Group.

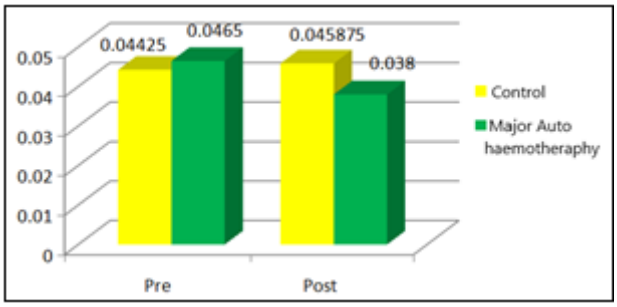

Figure 3: The MDA Content between Control Group and Treatment Group

4. Discussion

In addition to increasing endogenous antioxidants, ozone also has several other benefits [9] including, ozone therapy

activates the metabolism of red blood cells (RBC) by increasing 2.3 DPG (in Phospho Glycerate) and ATP (Adenosin Tri Phosphate) which resulting in increased release of O2, so it can improve tissue oxygenation throughout the body, increase the ability of immune cells by releasing cytokines such as interferon and interleukin, strengthen the immune system by increasing IFN β (Interferon β), TGF β 1 (Transformin Growth Factor β 1) .

Ozone is very effective in activating the body's immune system by activating endogenous antioxidants, ozone is also very effectively used to kill viruses, bacteria, and fungi, abscesses, allergies, disorders of arterial circulation, gangrene, cystic ulcers, hepatic cirrhosis, hepatic cirrhosis, polyneuritis, polyarthritis, thromboplebitis, disorders wound healing, Parkinson's disease, hepatitis, ginggivitis, paradontosis [10].

5. Conclusion

Based on the results of research on ozone therapy in heavy smokers at a dose of 40 µg / ml, the following conclusions are obtained:

Provision of ozone therapy reduces levels of free radicals in the blood of active smokers by 23.16%.

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