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Research Article

Sudarshan Kriya, Yoga and Antioxidant Enzymes – A Novel Relationship

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Abstract

Introduction: Health of an individual depends on stress. Stress is less, healthier the individual. Oxidative stress is an internal damage caused by oxygen free radicals. The free radical damage can be minimised by enhancing the cellular antioxidant system and decreasing the lipid peroxidation.

Aims and objectives: Our earlier research had shown that practise of SKY lowers the lipid peroxidation & lipid lowering effect. This prompted us to study the biological variability like erythrocyte esuperoxide dismutase (E-SOD) & blood glutathione peroxidise (GSHpx) in normal subjects who were practicing Sudarshan Kriya Yoga.

Materials & Methods: In this study 46 normal participants of basic course conducted by Ved Vignan Maha VidyaPeeth were selected for evaluation. Their MDA, E-SOD & blood GSHpx levels were analysed before the start of SKY practice& consecutively at 7th day & 45th day after their practising SKY daily.

Results: This study demonstrates that the levels of E- SOD & blood GSHpx were lower in the participants before SKY practise & the same were significantly increased after 7th& 45th day of SKY practise. There was significant decrease in serum MDA levels after 7th&45th day of SKY practise.

Conclusions: This observation suggests that practise of SKY enhances the body's natural defence mechanism by improving the quality & length of life by preventing the damage caused by free radicals.

Keywords: SKY-SudarshanKriya yoga,MDA-Melanoldialdehyde, SOD-Superoxide dismutase, GSHpx- Glutathione Peroxidase.

1. Introduction

An individual he/she can improve the quality of life by preventing the things bad for health & by improving the things that are good. Health is not mere absence of disease but is a state of wellbeing at the physical, mental or social levels.[1] Oxygen is the most critical nutrient for life & is the main source of free radicals. Oxidative stress is an internal damage caused by oxygen free radicals.[2] Free radicals and peroxides are clearly involved in physiological phenomena such as synthesis of prostaglandins & thromboxane's, & in pathogenesis of various diseases, including atherosclerosis, inflammatory diseases & cancer.[3] Free radicals are also thought to participate in ageing process. Free radicals can be produced in dangerous amounts by irritants such as cigarette smoke, pesticides, air pollution, UV light, radiation etc. These free radicals are efficiently taken care of by the powerful antioxidant defense mechanisms like-vitamin-E & C, carotenoids & antioxidant enzymes.[4,5]

Among the enzymes SOD(EC-1.15.1.1.) catalyses dismutaion of the superoxide anion (O_2^-)into H_2O_2, and glutathione peroxidase (GSHpx-EC 1.11.1.9.) detoxifies H_2O_2 & converts lipid hydro peroxides to nontoxic alcohols.[6]Our earlier research data on SKY Practice demonstrated that in normal healthy individuals, there was elevation of HDL cholesterol & decreased level of total cholesterol, LDL cholesterol & MDA levels.[1]

In some recent clinical studies, one or several of these antioxidant enzymes were measured in blood as possible biological indicators in diseases like: cardiovascular diseases, cancer, respiratory diseases, liver damage, cataract, agingetc.[4, 5, 7,8, 9,10,11,12,13] Hence the present study was conducted to evaluate the effect of SKY Practise on lipid peroxidation & the role of E-SOD & blood GSHpx levels in normal subjects.

2. Material & Methods

The subjects for the study (46nos) were selected from the participants of the Basic Course on human values conducted by Ved Vignan Maha Vidya Peeth, Bangalore. Trained SKY teacher taught Sudarshan Kriya Yoga (SKY).

SKY has three sequential components:

1 Pranayama
2 Bastrica
3 Cyclical breathing (going through increasing frequencies 20:40:40 cycles of three rounds)

Daily practise of SKY for about 30 minutes, continued for 45 days. Participants were of different age groups &both the sex.

2.1 Exclusion criteria

*Patients on anti-inflammatory drugs, Antidepressants, Thyroid hormone.
*Patients with history of liver disease, cancer, alcohol consumption, smoking, hypertension & diabetes mellitus.
*patients on hormonal replacement therapy

5ml of venous blood was collected from the participants at three different stages:

1. Before start of SKY.
2. 7th Day after practicing SKY.
3. 45thDay after practicing SKY.

2ml of blood is collected in sterile heparinised tube& 3 ml in plain tube. The serum separated from the plain blood used for estimation of MDA by thiobarbituric acid method by using semi auto analyser (14).

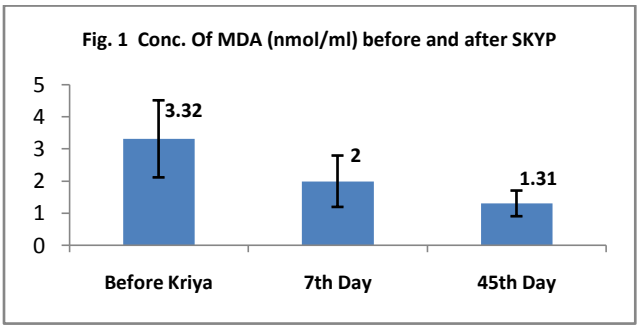
RBCs are separated from heparinized blood & used for the estimation of erythrocyte SOD levels & the blood for GSHpx levels by using RANDOX kits using fully automated clinical chemistry analyser.

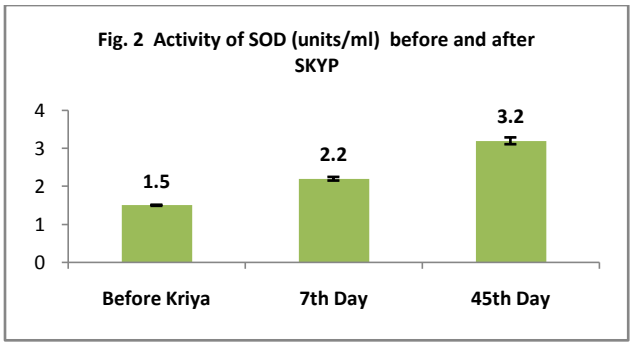
2.2 Statistical Methods

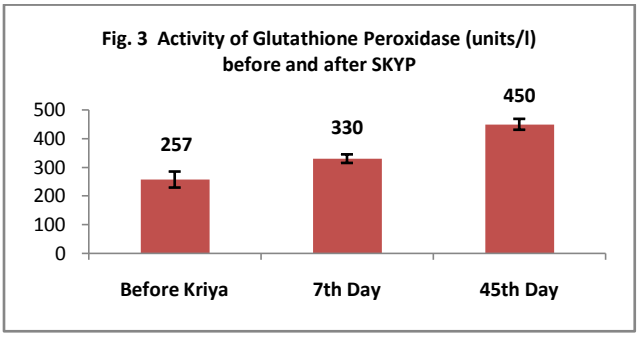
Statistical analysis was performed by using Epi-info™ 7 software from CDC. Mean, standard deviation and student t tests were applied wherever applicable.

3. Results

The mean ±SD of E-SOD, Blood GSHPX; & serum MDA levels of 46 participants of the present study are exhibited in Fig-1,2,3.







4. Discussion

Oxidative stress is an internal state of damage caused by oxygen free radicals. This condition arises when the production of free radicals exceeds the cellular antioxidant system. Cell membranes are rich sources of polyunsaturated fatty acids are readily attacked by free radicals damaging membrane proteins, making the membrane leaky producing lipid hydro peroxides. These lipid hydro peroxides break down to short chain toxic compounds known as Melondial- dehyde (MDA) which is measure of oxidative stress. The defence system include a network of antioxidant enzymes namely, SOD in RBC'S & blood GSHpx.[7, 8, 10]

Present study is undertaken to compare the lipid peroxides (MDA) as a marker of oxidative stress & E-SOD, blood GSHpx activities in normal persons before & after the practise of SKY. This study demonstrates that level of serum MDA decreased after 7th& 45th day of SKY practice as compared to the values before practice of SKY (3.32 ±1.28nmole/ml) (Fig-1) which is statistically significant. It is observed that E-SOD & blood GSHpx are lower in the participants before practice of SKY & they are significantly elevated after 7th&45th day of SKY practice (Fig-2,3).

It is also observed that (Fig-1, 2, &3) the relationship between lipid peroxides (MDA) & E-SOD, blood GSHpx are inversely related. Our data show, SKYP has a strong tendency towards an increase in antioxidant enzymes (SOD and GSHpx) and decreasing lipid peroxidation. Thus Sudarshan Kriya Yoga practise (SKYP) possibly constitutes a step forward in the search of improvement of quality of life by preventing the damage caused by Free radicals.

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