UNIVERSITY OF GRANADA

Research Group CTS-101:
"Intercellular Communication"

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EVALUATION OF NEUTRALIZATION OF LOW INTENSITY RADIATION HARMFUL EFFECTS ON FIVE SUBJECTS CELLS REDOX MARKERS

Pranan Technologies
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1- GOAL

The study was conducted with 5 volunteer subjects to assess the effectiveness of use of Pranan Technologies devices Phione, Vitalizer and Relax. Two extractions of blood were made, one series before using the devices and another series one month after daily use.

2- PARAMETERS MEASURED: LPO and GSH

Oxidative damage markers

Evaluation of cellular and subcellular membranes oxidation (LPO)

A very important mechanism by which ROS Reactive Oxygen Species or oxygen free radicals can produce cellular injury is by lipid peroxidation of the cell membrane. Lipid peroxidation occurs by action of free radicals on polyunsaturated fatty acids. These changes in cell membrane structure cause other changes in their physicochemical properties, with increased permeability and progressive loss of their functions, which can lead to subsequent cell death. The measure of the degree of lipid peroxidation of membranes has always been considered an important parameter as an indicator of oxidative stress.

The index of lipid peroxidation is provided by the quantification of malonyldialdehyde and 4-hidroxyalkenal present in the sample, which are important decomposition products of peroxides derived from polyunsaturated fatty acids and their related esters.

The concentrations of malonydialdehyde and 4-hidroxyalkenal, and the concentration of hydroperoxides provides a convenient index of lipid peroxidation.

Evaluation of antioxidant defenses

The cell is equipped with a very important antioxidant machinery, so it is important to measure the antioxidant activity of the organism.
Within this antioxidant system there is a group of enzymes that are responsible for cell detoxification of free radicals in physiological conditions. The glutathione system is housed within, and maintaining an adequate concentration of reduced glutathione (GSH) is essential for the activity of these enzymes. Therefore, when the GSH increases the antioxidant capacity increases too.

3- RESULTS

LPO: lipid peroxidation index

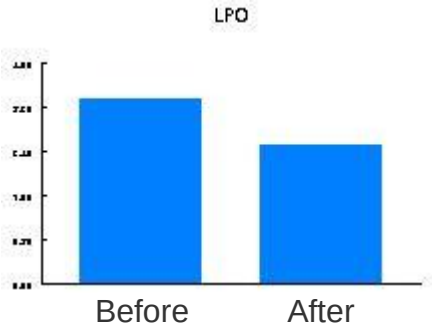

Figure 1: Values of LPO parameters in 5 subjects before (Basal) and 30 days after daily use of PRANAN Technologies devices.

As shown in Figure 1 the use of PRANAN Technologies devices (**Pranan Harmonizer 8-R-5 Relax, Pranan Vitalizer 8-V-11 and Pranan Phione Neutralizer**) by 5 subjects for 30 days show a decrease in LPO levels, from an average rate of 3.35 to 2.51. That is, LPO index was reduced by 33.47%.

GSH: reduced glutathione

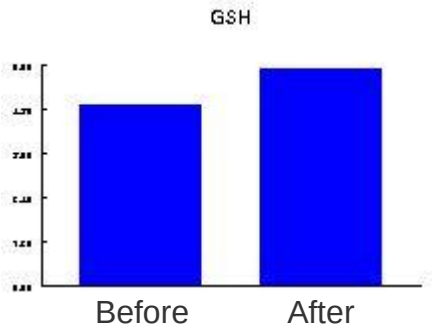

Figure 2: Values of intracellular GSH parameters determined in 5 subjects before (Basal) and 30 days after daily use of PRANAN Technologies devices.

Figure 2 indicates that 30 days after daily use of Pranan Technologies devices (**Pranan Harmonizer 8-R-5 Relax, Pranan Vitalizer 8-V-11 and Pranan Neutralizer Phione**) by these 5 subjects, reduced glutathione GSH levels increased from an average rate of 4.90 to 5.70. That is, the GSH index increased by 16.28%.

GSH / GSSG, reduced /oxidized glutathione levels

Reduced/oxidized glutathione levels (GSH / GSSG) constitute an important indicator for redox ratio assessment. An increase in this ratio indicates that the cell is more protected against oxidative stress since there is an increased GSH and decreased GSSG.

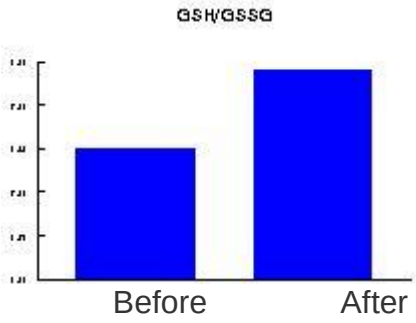

Figure 3: Values of intracellular GSH parameters determined in 5 subjects before (Basal) and 30 days after daily use of PRANAN Technologies devices.

Figure 3 indicates that 30 days after daily use of Pranan Technologies devices (**Pranan Harmonizer 8-R-5 Relax, Pranan Vitalizer 8-V-11 and Pranan Neutralizer**) reduced/oxidized glutathione levels (GSH / GSSG) increased from an average rate of 5.40 to 8.90. That is, the GSH / GSSG ratio increased by 64.81%.

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