# Polysomnographic and Biochemical Study of the Effect of Controlled Rest in the Human Body

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**RESULTS OF RESEARCH PROJECT**

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## OBJECTIVES

The objectives of this study were the following:

1 °. Assess the effectiveness of sleep in a HOGO bed for a month, measured week to week, in those hormonal parameters, oxidative stress, and inflammation, indicative of the health status of the subject.

2 °. Assess the effectiveness of sleep in a HOGO bed for a week on quality of sleep and subjective rest.

## RESULTS FROM OBJECTIVE 1

### A. Oxidative stress markers

Several extracellular oxidative stress parameters (LPO, lipid peroxidation and NOx, nitrite were determined) in plasma, and intracellular (GSH, reduced glutathione; GSSG oxidized glutathione, as well as the ratio GSSG / GSH) in the red blood cells of study subjects. Measurements were performed in all cases at 9 of the morning.

As seen in Figure 1, after 30 days of rest in the HOGO rest system, oxidative stress levels were significantly reduced, highlighting the LPO decreased ($P < 0.05$) and NOx ($P < 0.05$) in plasma, indicating improvement substantial free radical damage to cells of the organism. Also, the ratio GSSG / GSH significantly decreased ($P < 0.05$). This ratio is considered today as the most accurate reflection of what happens in the cell, i.e., the intracellular redox state. The decrease in this ratio at 30 days of study demonstrates the effectiveness of the rest to reduce free radical damage in cell, which is considered of great benefit to the subject.
Accordingly, the HOGO rest system provides a direct protection against free radical damage

throughout the body, which will result in a better physiological condition of the study subjects.

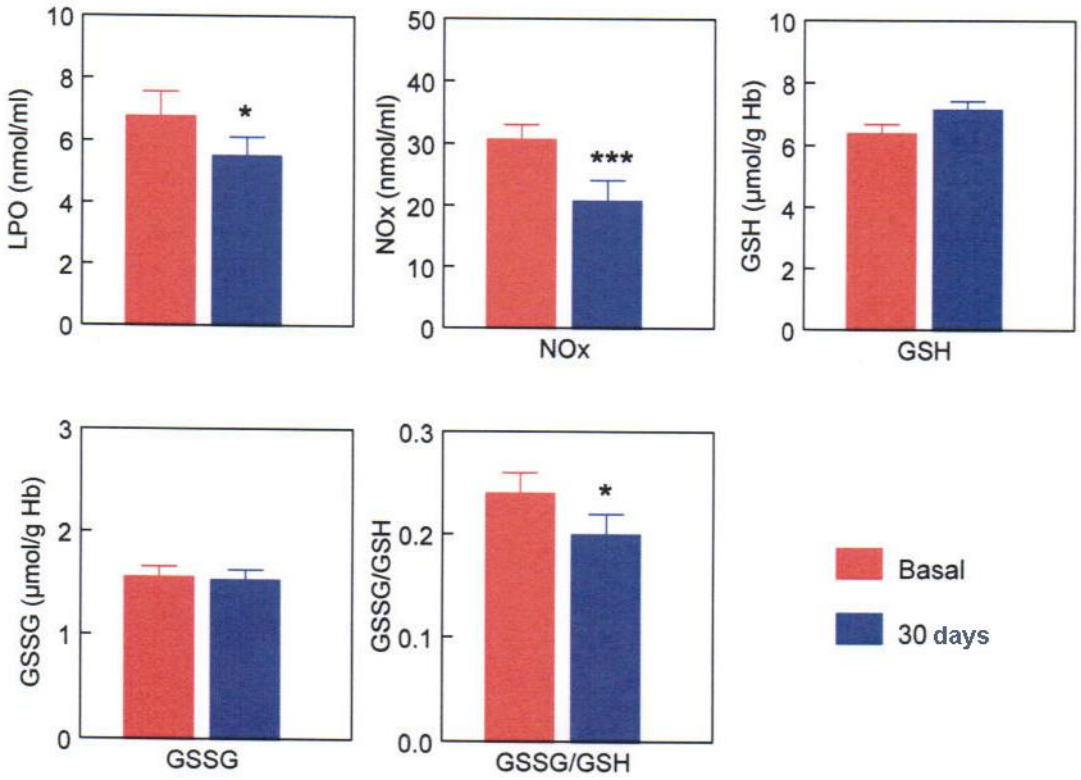


**Figure 1**: Values of oxidative stress parameters determined in the study subjects before (basal) and after 30 days of use HOGO rest system.

**B. Inflammatory markers**

In this case, two parameters have been determined. One, included in Figure 1, which are nitrites (NOx), and another, as shown in Figure 2, which are pro-inflammatory cytokines.

In the first case, one can observe a significant decrease of the inflammatory process, reflected in decreased levels of nitrite (Figure 1). There is, therefore, a decrease in chronic inflammatory state in these subjects.

In relation to pro-inflammatory cytokines, we can see that the basal levels of interleukin 1ß (IL-1ß), interleukin 6 (IL-6) and tumor necrosis factor alpha (TNFa), are within the normal

range and therefore unseen significant changes after 30 days. In relation to interferon gamma (INFg) we do observe how a significant decrease in their levels at 30 days ($P < 0.05$) is produced, speaking in favor of a reduction of the chronic inflammatory state on study subjects.

Accordingly, the use of the HOGO rest system produces at 30 days, a significant reduction in the chronic inflammatory state of the study subjects, reflected in low levels of nitrites and INFg reduction. These data speak in favor of an improvement of the overall state of these subjects, which are subject to a lower burden of inflammatory stress.

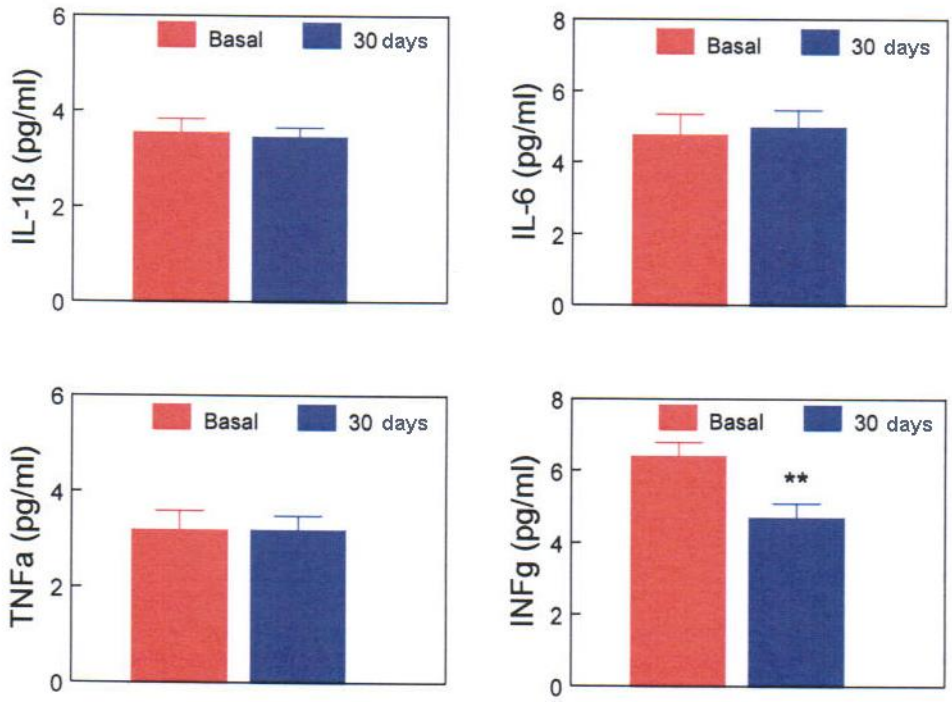


**Figure 2**: Values of pro-inflammatory cytokine levels measured in the study subjects before (basal) and after 30 days of use HOGO rest system.

### C. Chronic stress markers

We include in this section two major health status markers of the subject (Figure 3). Firstly, levels of cortisol in the morning and evening before and after 30 days of rest on the HOGO rest system, and secondly urinary excretion levels of melatonin in the form of 6-sulphatoxymelatonin.

Cortisol results show in a very clear way that the HOGO rest system greatly reduces chronic stress status of the subjects. Indeed, the level of cortisol in the morning decrease very significantly (P <0.001) at 30 days, while the levels of the evening is kept equal, within normal range.

When we evaluated the urinary excretion of melatonin, we also observed surprising results. The urinary excretion of this metabolite of melatonin (which makes up 90% of melatonin excreted in the urine), also decreased very significantly (P <0.001), which is telling us that the Melatonin, the major endogenous antioxidant that has the body, is struggling effectively against oxidative stress and inflammation, reducing them. During this process, various other metabolites different of 6OH-melatonin are metabolized, so we see how it goes down.

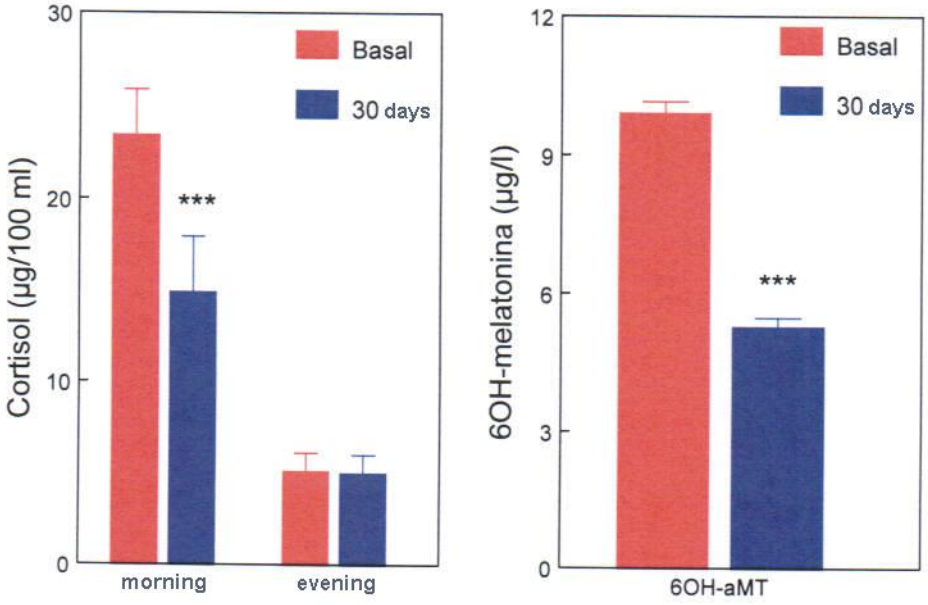


**Figure 3**: Levels of plasma cortisol and urinary excretion of 6-sulfatoxiumelatonina (6OH-melatonin) before (basal) and after 30 days of use HOGO rest system.

## Conclusions

The results of this part of the study confirm earlier findings and irrefutably demonstrate, using new markers analyzed here, that the HOGO rest system is an excellent measure against chronic state of oxidative stress and inflammation, correcting to a state of perfect physiological control of subject, resulting in a good state of health thereof.