EFFECTS IN RECOVERY PROCESSES OF A 6-WEEK NON-INVASIVE NESA NEUROMODULATION APPLICATION IN PROFESSIONAL BASKETBALL PLAYERS: Randomized clinical trial

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INTRODUCTION

The competitive calendars of team sports are increasingly compressed, generating changes in the cycle of effort-recovery and sleep. Faced with this new situation, it seems necessary to analyze how the quality of rest affects physiological and performance levels. There are a small number of effective treatment methods that act on the quality of sleep in athletes. Nesa non-invasive neuromodulation, through the modulation of the autonomic nervous system with microcurrents, can be useful to improve sleep quality and sympathetic activation in stressful situations.

AIMS

With this study we want to deepen the responses generated by professional basketball players (20.9 (SD 2.4) years; 196.7 (SD 11.5) cm; 89.0 (SD 21.2) kg) to the stimuli and loads generated over 6 weeks of training and competition on sleep quality and the implication of Nesa non-invasive neuromodulation.

METHODS

A double-blind randomized clinical trial (experimental and placebo group) was conducted. The experimental group was treated with non-invasive Nesa neuromodulation for 6 weeks (12 sessions, 2 times/week) with programs P5 and P7 (45 min). Sleep variables, extracted from the Oura device, of duration, REM, total sleep and heart rate variability (HRV) were analyzed in order to observe the players' recovery and adaptations. (Clinical trial gov registration NCT04939181)

RESULTS

A significant difference was obtained (p value= <0.001; 0.007; <0.001; <0.001) for the improvement of all the sleep variables between post-intervention in the experimental group. Non significance were found for biomarker except for cortisol. Showing a normalization of the experimental sample, especially in the last two weeks where they entered the playoffs. This study shows that the use of non-invasive NESA neuromodulation in players can allow improvements in sleep quality and even a stabilization of the variables despite a stressful situation.

Variables	Groups	Mean (SD)(s)	Mean (SD)(min)	Mean(SD)(h)	Mean differences (s)	Mean differences (min)	Mean differences (h)	p-value
DURATION	NESA (n=240)	27849,5	464,16	7,74	1915,82	31,93	0,53	0.000
	PLACEBO (n=228)	25933,68	432,23	7,20				
REM	NESA (n=240)	3058,88	50,98	0,85	512,43	8,54	0,14	0.007
	PLACEBO (n=228)	2546,45	42,44	0,71				
TOTAL	NESA (n=240)	22734,13	378,90	6,32	1920,18	32,00	0,53	0.000
	PLACEBO (n=228)	20813,95	346,90	5,78				

Table 1. Significant variables summary described by seconds, minutes and hours.

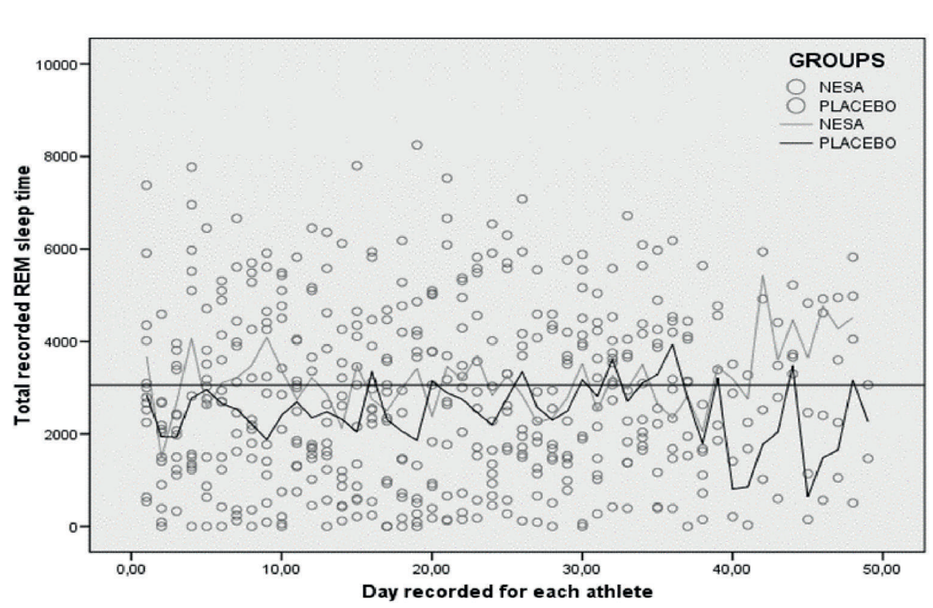

Figure 1. Scatter diagram of the REM variable on each day recorded for each athlete.

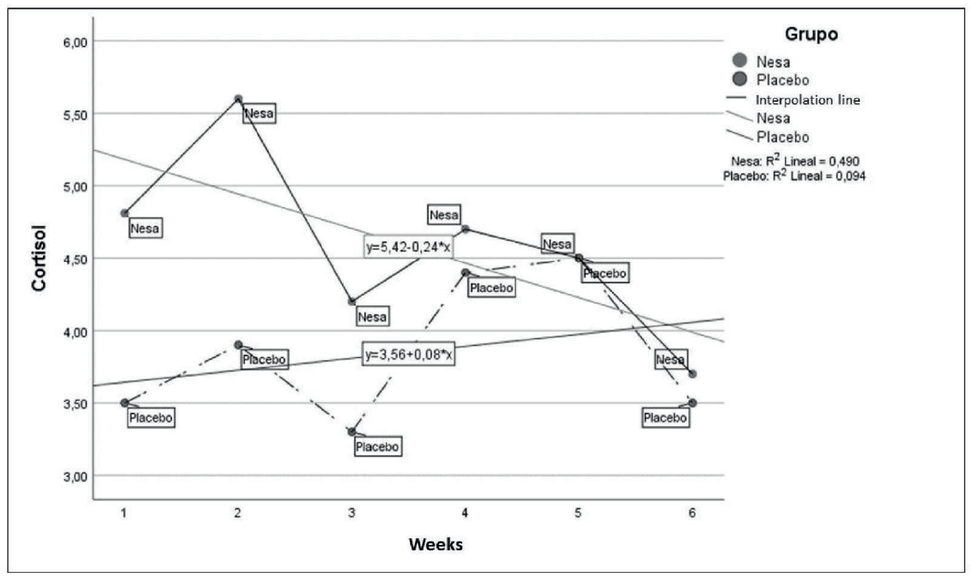

Figure 2: Distribution of the mean salivary cortisol concentration by group throughout the weeks of treatment. The table is complemented with lines that plot the concentration trend in each group.

NESA non-invasive neuromodulation is effective to improve sleep cuality in phase REM, sleep duration phases and duration total of sleep during the night in elite athletes and could initiated an interesting research field in the neuromodulation of the autonomic nerve system and sleep quality.

In terms of biomarkers, significant differences were found for cortisol between groups, although further studies are needed to confirm the relationship between this hormone and NESA non-invasive neuromodulation. NESA non-invasive neuromodulation it is a new hope to modulate superficially autonomic endogen's function.

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