

Rest-Activity circadian Rhythms and Body Mass Index In women with metabolic syndrome

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The metabolic syndrome is a complex of interrelated risk factors such as abdominal obesity, high blood pressure, dyslipidemia and high fasting glycemia. These risk factors expose the subject to cardiovascular diseases and type 2 diabetes mellitus. Furthermore, it has been shown that there is a correlation between circadian rhythms and metabolic syndrome. The circadian rhythms produce 24-hour oscillations of several physiological variables and any irregularity of these rhythms exposes the subject to an increased risk of metabolic syndrome [1]. Aim of the study was to investigate a possible direct correlation between Rest-Activity circadian Rhythms (RARs) and Body Mass Index (BMI) in subjects with metabolic syndrome. We recruited 52 adult women with metabolic syndrome in care at Fondazione IRCCS, Istituto Nazionale Tumori. All participants underwent a continuous 7-day actigraphic monitoring to detect the RARs. Subsequently, they were subdivided into 3 groups referring to their BMI: group 1, with BMI between 25 and 30 (n=18), group 2, with BMI between 30 and 35 (n=27), and group 3 with BMI >35 (n=8). All data were analyzed by single cosinor method to obtain MESOR (M), amplitude (A) and acrophase (\emptyset) for each subject. Then, on these values we applied the mean cosinor method to evaluate the parameters M, A and \emptyset for each group. We found statistically significant differences for MESOR (M group 1: 269.8 vs M group 2: 226.9; $p < .05$) and amplitude (A group 1: 212.1 vs A group 2: 171.8; $p < .05$) between group 1 and 2 by Hotelling test. These results show a trend to have an inverse correlation between BMI and MESOR, and BMI and amplitude.

Reference

[1] Sohail et al. (2015) Irregular 24-hour activity rhythms and the metabolic syndrome in older adults. *Chronobiology International* 32(6): 802–813.

Keywords

Metabolic syndrome, actigraphy, circadian rhythm, women, body mass index, physical activity levels