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CHANGES IN THE RELATIONSHIPS BETWEEN AEROBIC CAPACITY AND HEMATOLOGICAL VARIABLES AFTER A DIET AND EXERCISE INTERVENTION

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Introduction The relationships between maximum oxygen uptake (VO₂max) and hematological variables related to oxygen transportation are obviously established, but it is unknown if these associations are different between responders and non-responders to VO₂max. The aim of this study was to evaluate whether VO₂max relate to hemoglobin and hematocrit measured before and after a weight loss program (WLP) intervention, in responders and non-responders to VO₂max

Methods One hundred eighty-six overweight (W) and obesity (O) (body mass index [BMI] 25-34.9 kg/m²), aged from 18 to 50 years, performed an incremental test until exhaustion on a treadmill, using a modified Bruce protocol, before (pre) and after (post) the 22 weeks of diet and exercise intervention. Blood samples were taken to measure hematological parameters (1). Responders to VO₂max were defined as those who achieved an increase higher than 5% in VO₂max and non-responders those who achieved less than 5%. Relationships between VO₂max, hemoglobin and hematocrit were measured using Pearson's correlation coefficient in responders and non-responders. The significant level was set at 0.05. Results Maximum oxygen uptake was associated with hemoglobin in non-responders, both pre intervention (r=0.606, p<0.001) and post intervention (r=0.596, p<0.001). There was also a positive relationship between VO₂max and hemoglobin in responders, even though this association was greater both pre and post intervention (r=0.754, p<0.001; r=0.623, p<0.001, respectively). Non-responders had lower correlations between VO₂max and hematocrit than responders pre weight loss program (WLP) (r=0.574, p<0.001; r=0.732, p<0.001, respectively), while the relationship was similar in both groups post WLP (r=0.567, p<0.001; r= 0.555, p<0.001). Discussion Applying Fick's law, these results suggest that the improvements in VO₂max obtained post WLP in responder group could be due to an increase in the use of oxygen and / or an improvement of local vascularization.

References 1. Zapico et al.: Nutrition and physical activity programs for obesity treatment (PRONAF study). Methodological approach of the project. BMC Public Health 2012 12:1100.