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Pea protein ascorbic acid microcapsules are more effective than ascorbic acid-free in the attenuation of oxidative stress biomarkers after simulated soccer game exercise protocol among young professional players

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Statement of the Problem: Soccer players reach high intensity effort during competitive games and deleterious body symptoms can occur as consequence of oxidative stress (OS). Depending on metabolic adaptation body homeostasis can be delayed, compromising performance. Rapid recovery is relevant during competitive season, when games occur at small intervals. Nutritional interventions with ascorbic acid (AA) were proposed aiming attenuation of OS blood biomarkers, however, literature is controversial as concerns its effectiveness. This might be due to the saturation mechanism of absorption site and we proposed that microencapsulation is an alternative to improve bioavailability. Our aim was to evaluate the effect of pea protein isolate (PPI) microencapsulated AA administered immediately after a simulated game exercise protocol over OS biomarkers.

Methodology & Theoretical Orientation: A double-blind crossover placebo controlled study was undertaken with 10 young players from a Brazilian elite sport club. Players were submitted to three nutritional treatments: PPI/AA; AA-free and placebo (P); AA doses were 1g. Blood parameters (catalase CAT, AA, total antioxidant capacity TAC, hydroperoxide HP, malondialdehyde MDH and creatine kinase CK) were monitored over time-course analysis up to 60 min after exercise.

Findings: PPI/AA had earlier decreasing effect than AA-free ($p < 0.05$) on HP levels (20min vs 40mins), while MDH was not attenuated by any AA treatment. Enhancement in TAC was significantly higher ($p < 0.05$) in PPI/AA than in AA-free (845.54 ± 56.66 vs 766.53 ± 64.44 $\mu\text{mol.AAeq}^{-1}$). CAT had no variation. Absorption kinetics of AA from PPI/AA had typical profile of sustained release system, promoted by microencapsulation. All AA-free parameters were not statistically different from P, except for AA blood concentration.

Conclusion & Significance: Exercise protocol induced a rise on oxidative molecules and PPI/AA microcapsules were more effective than AA-free on their attenuation. Further analyses regarding player's physical performance will furnish more information about microcapsules functionality on body recovery.

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