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Effect of a multi-ingredient supplement on intermittent sprint performance, fatigue perception, muscle damage and immunosuppression in recreational athletes

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Background

It has been suggested that carbohydrate-protein based multi-ingredient supplements may attenuate exercise induced muscle damage (EIMD) and immunosuppression. This study investigates the effects of a commercially available carbohydrate-protein supplement (MTN) enriched with L-glutamine, L-carnitine-L-tartrate compared to carbohydrate alone (CHO) or placebo (PL), on sprint performance, muscle damage, immunosuppression markers and recovery from an intermittent exercise bout.

Methods

On three occasions, in a counterbalanced order, 16 recreationally trained males volunteered to ingest a multi-ingredient supplement, a carbohydrate supplement or placebo before, during and immediately after a 90min intermittent repeated sprint test (IRS). Measurements included total sprint time and the rate of perceived exertion (RPE) expressed along the IRS. In addition 15m sprint, creatine kinase, myoglobin, interleukine-6, Salivary α amylase; Neutrophil; Lymphocytes and Monocyte were assessed pre, immediately post, 1h and 24h after exercise. Consent to publish the results was obtained from all participants.

Results

Total sprint times were not different between conditions. RPE increased during the IRS for all conditions, however MTN showed a significant ($p<0.001$) lower value at the end (15.9±1.4) compared to PL (17.8±1.4) but not with respect to CHO (17.0±1.9). 15m sprint time was reduced ($p<0.05$) at post, 1hr and 24hr compared to pre with no differences between conditions ($p>0.05$). Myoglobin increased ($p<0.05$) in all three conditions at post, and 1hr compared to pre, showing lower values at 1hr ($p<0.05$) for the CHO and MTN compared to PL (241.8±142.6 $ng{\cdot}ml^{-1}$ and 265.4±187.8 $ng{\cdot}ml^{-1}$ vs. 518.6 ± 255.2 $ng{\cdot}ml^{-1}$ respectively). Interleukin-6 was significantly increased at post and 1h compared to pre ($p<0.05$) being significantly higher for MTN at post (5.2$pg.ml^{-1}$) and 24hr (2.4$pg.ml^{-1}$) respect to CHO (4.5±2.1 and 1.9±2.5 $pg.ml^{-1}$) but not respect to PL (4.9±2.4 and 1.8±2.4 $pg.ml^{-1}$). Creatine kinase peaks at 24hr for the three conditions with no differences in between them. MTN showed a significant higher Neutrophil concentration (4.9±1.8 10^9/L) at 1hr compared to CHO (3.9±1.5 10^9/L) but not to PL (4.5±1.6 10^9/L).

Conclusion

Ingesting a multi-ingredient supplement during and immediately after a 90min intermittent repeated sprint test resulted in no effects on performance and higher Neutrophil counts. However, fatigue perception and the accumulation of some muscle damage markers (Mb) could be attenuated.

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