The effect of carbohydrate consumption on maximum force production

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Abstract:

Purpose: Whether ingestion of glucose improves resistance training and performance remains unclear. The purpose of this study was to assess maximal isokinetic leg extension force in response to glucose ingestion and determine whether performance changes in a time-dependent manner.

Methods: Seventeen young (22.1±3.9 years), lean (%BF: 14.3±8.0; %BF Males: 9.7±4.2; %BF Females: 23.7±4.2) and recreationally active (>150min/week of physical activity) non-diabetic male (n=11) and female participants were recruited. Using a double-blinded cross-over design, participants performed sets of 3 maximum isokinetic efforts on a dynamometer (HumacNorm) before and after (5-, 15-, 30-, 45-, 60-, 75- and 90-min post) ingesting either a carbohydrate (75 g glucose) or isovolumic placebo (saccharin-flavoured) drink. Blood glucose and EMG were recorded concurrent with force output (peak force; average force during single best repetition).

Results: Despite a significant rise in blood glucose, there were no significant differences in any of the raw force or EMG parameters recorded in response to glucose ingestion. When expressed as a percentage of baseline force, there was a decrement in force with glucose ingestion (main effect of condition, p=0.012), however, this effect was small (d<0.1).

Conclusion: The ingestion of glucose does not improve performance of maximal isokinetic efforts in recreationally active young individuals. However, in considering the potential for carbohydrates to enhance the anabolic environment, there may still be some benefit of glucose ingestion to training.