

THE INFLUENCE OF ALCOHOL COMBINED WITH CARBOHYDRATE OR ARTIFICIAL SWEETENERS ON ALCOHOL PHARMACOKINETICS

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Introduction and Aims: Previous research suggests responses to alcohol may be affected by the presence of carbohydrate. This study investigated the impact of consuming a moderate dose of alcohol combined with different doses of carbohydrate or an artificial sweetener on alcohol pharmacokinetic responses.

Design and Methods: Twenty-six females (25.1±0.7yrs) completed a randomised cross-over study involving four experimental trials. Identical doses of alcohol (vodka, 0.96±0.09 ml/kg) were consumed in each trial mixed with either water (W), water + artificial sweetener (150±1mg aspartame) (AS), or water + carbohydrate (15g or 50g sucrose; 15CHO and 50CHO). Breath alcohol concentrations (BrACs) were sampled over a 210-minute monitoring period following ingestion and analysed using a WinNonlin non-compartmental pharmacokinetic model. BrAC estimations and self-reported ratings of intoxication, impairment and willingness to drive were recorded throughout trials. Cognitive function was assessed using a four-choice reaction time task.

Results: Mean BrACs were reduced in a CHO-dose response manner when alcohol was consumed with mixers containing carbohydrate compared to both W and AS trials. Pharmacokinetic analysis revealed significant differences in C_{max} (W=0.057±0.002, AS=0.054±0.002, 15CHO=0.050±0.002, 50CHO=0.040±0.001%) and AUC_{last} (W=4.80±1.12, AS=4.61±0.99, 15CHO=4.10±0.86, 50CHO= 3.11±0.58mg*g/dL) when carbohydrate-containing beverages were consumed compared to W or AS trials. No difference in time to reach maximum concentration (t_{max}), subjective ratings or choice reaction time was observed between trials.

Discussion and Conclusions: Consuming alcohol with carbohydrate-containing mixers appears to attenuate peak BrAC and lower total alcohol exposure compared to an artificially sweetened mixer in a dose response manner. However, subjective ratings and objective performance appear to remain unaffected.

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