Alcoholic beverages lower acute glucose and insulin responses in healthy subjects

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Moderate alcohol intake has been related to lower risk of type 2 diabetes and coronary heart disease in epidemiological studies. In intervention studies, consumption of one or two alcoholic drinks has been associated with improvements in insulin sensitivity. Little is known about the direct effect of alcoholic beverages on acute glucose and insulin responses, either when consumed alone or with a mixed meal.

We studied the impact of three types of drinks (beer, white wine and gin) with and without a carbohydrate-containing meal on responses over two or three hours in 10 (5 M, 5 F) young healthy volunteers. Blood was sampled by capillary fingerprick at 15 min intervals during the first hour and at 30 min intervals during the second and third hour. A standard breakfast was given 2 h before the test meals.

In the first study, the three types of drinks or white bread were fed alone as 1000 kJ (240 Calorie) portions. Taking the area under the glucose curve (AUC) after bread as 100, the AUC after beer was 58 ± 1, after white wine 7 ± 3 and after gin 10 ± 5 (all differences $P < 0.01$). Both glucose and insulin responses declined gradually over the second hour and insulin levels were 15–30 pM less at 2 h than at baseline.

In the second study, the same beverages or water were fed together with a 2000 kJ (480 Calorie) portion of white bread. Taking the glucose AUC to bread and water meal as 100, the beer and bread was 84 ± 11, wine and bread 63 ± 6 and gin and bread 80 ± 11 (Figure). Only the white wine produced significantly ($P < 0.01$) lower glucose responses than bread and water and the effect was more pronounced in males than in females. There was a trend toward lower insulin responses in the first hour but the differences were not statistically significant at the $P < 0.05$ level.
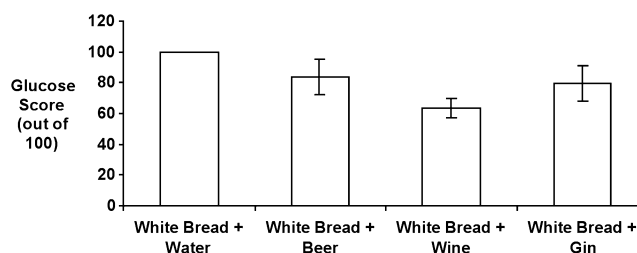

Figure. Relative glucose responses to 2000 kJ portion of white bread with and without 1000 kJ serving of alcoholic beverage. Only white wine was significantly different to bread and water ($P < 0.01$).

We conclude that alcoholic beverages, particularly wine, help to lower glucose and insulin responses after a carbohydrate-containing meal. Since postprandial hyperglycemia has been linked to higher risk of cardiovascular and total mortality (1), one of the mechanisms by which alcohol might exert its protective effect is via reductions in the glycemic response to high carbohydrate meals.

Reference
1.   de VF, Dekker J, Ruhe H, *et al.* Hyperglycaemia is associated with all-cause and cardiovascular mortality in the Hoorn population: the Hoorn Study. Diabetologia 1999; 42: 926–31.