BACKGROUND

An estimated 6% of US residents are currently diagnosed with diabetes; of these an estimated 90–95% have type 2 diabetes. Diabetes is a leading cause for the amputation of lower extremities, cardiac problems, kidney failure, blindness, and is strongly correlated with obesity, in particular, visceral obesity.

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square with a color chart. The mean body weight and the mean urinary glucose concentrations for the treatment group and the control group were compared using 1-tailed, two sample t tests.

RESULTS

The mean weight of the rats that did not drink alcohol was significantly higher than that of the rats that drank (P<.05) (Figure 1). Body weight did not significantly increase with age for either treatment during the study period (P>.05, Figure 1). The mean concentration of glucose was always higher for the rats that drank alcohol. This difference, however, was not statistically significant (P>.05) (Figure 2) and mean values were always within the normal range for a healthy rat (0–200 mg/dL).

Similarly, although higher ketone levels were more common in the urine samples taken from 7- and 7.5-month old rats that drank alcohol than from the urine of the other alcohol-drinking rats or the control rats, the concentration of ketones, in all of the urine samples, were within the normal range for a healthy rat, 0–10 mg/dL (Figure 3).

DISCUSSION

Although the non-drinking rats were heavier than the rats that drank, this difference was presumably due to the food deprivation that was part of the alcohol-drinking rats’ conditioning. As rats kept on the drinking regime should ultimately develop visceral obesity, we expect the difference between these two groups to equalize and the mean urinary glucose and ketone concentrations of the treatment group to surpass those of the control as obesity develops.

Given the trend towards higher urinary glucose and ketone levels (Figures 2, 3) and the expected development of visceral obesity, we expect the rats that drank to develop symptoms of diabetes as they age. This suggests that, as the rats continue to age and continue to drink, there should be a tipping point. At this point, the urinary glucose and ketone levels of the treatment group should increase and exceed normal, healthy concentrations, whereas the glucose and ketone concentrations in the urine of the control group should remain in the normal range. If so, this would suggest that humans who consume alcohol at this level on a regular basis for an extended period of time are at a heightened risk of developing both visceral obesity and type 2 diabetes.

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