

Can the Effects of Green Tea on Gut Microbiota be Sustained?

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Studies have shown that green tea polyphenols can influence gut microbiota associated with a decrease of obesity and diabetes in mice fed a high-fat diet. This present study aimed to determine whether the effects of green tea polyphenols on gut microbiota (after 5 weeks of treatment of mice fed a low-fat diet) can be sustained after termination of the treatment in mice challenged with a high-fat diet. C57BL/6J (6-week old) male mice were fed a low-fat diet for 5 weeks. All 4 experimental groups, with 8 or 7 mice per group, were given drinking fluid containing 0.1% citric acid to stabilize the polyphenols and mask the bitter taste of tea preparations. During the 5 week period, one treatment group was given 0.6% green tea extract (GTE) and the other 0.2% epigallocatechin-3-gallate (EGCG) in drinking water. This time period is critical as most of the gut microbiome changes occur. Body weight, and diet and water/treatment consumptions were measured 3 times a week. The body weights for all groups increased steadily. The diet and water consumptions for all groups were approximately constant throughout the 5 week period. However, liquid consumption in the EGCG group was lower than other groups. After 5 weeks of treatment, all groups were switched to a high-fat diet (except one control group) with drinking water (no tea preparation) for 2 weeks. Body weight increased significantly for all 4 groups. The water consumption increased greatly at week 6, and then slightly declined by week 7. Diet consumption slightly decreased and remained constant throughout two week period. Fresh fecal samples were collected at week 0, 5, 6, and 7. Fasting blood glucose levels were measured at week 6 and 7 after treatment was removed. The control group with HFD was higher compared to other groups, but was not significant. In conclusion, no sustained effects (reduction in body weight and blood glucose levels) were observed due to the treatment. Supported by NIH R25ES020721.

