



Category: Metagenomics

Differential effects of whisky brands on human gut microbiome and fecal metabolome

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Abstract

The gut bacteria have significant impact on human physiology and are influenced by dietary habit [1]. Apart from normal diet, alcoholic beverages have also been shown to influence gut microbial makeup. The wine polyphenols have been linked to increase the beneficial bacteria in the gut after 4 weeks of consumption [2]. Consumption of alcoholic beverages for longer period (>10 years) has also been correlated to detrimental gut bacterial dysbiosis [3]. The contrasting effects of alcoholic beverages in these two studies necessitate further research. Globally, 45.7% of alcoholic drinkers are spirit drinkers with India having the highest (71%) [4]. In India whisky is preferred by most of the drinkers and 1400 million liters of whisky was consumed in India in the year 2012 [5]. Till date, no study has been reported to understand the effect of long-term consumption of different types of whisky on gut bacterial profile (GBP). In this purview apilot study of gut bacterial and metabolite profile was performed between the whisky drinker (n=18) and non-drinker (n=8) along with rice beer drinkers (n=3). PCR-denaturing gradient gel electrophoresis (PCR-DGGE) coupled with next generation sequencing (NGS) analysis on illumina miseq platform revealed decrease in gut bacterial diversity in the drinkers compared to the non-drinkers. The whisky types have differential effects on the GBP. The GBP of whisky type 1 drinkers had higher abundance of Clostridiaceae and Enterobacteriaceae (fold change log 2: 3.33 & 3.1537, respectively; $p < 0.002$) in comparison to the non-drinker group, while the type 2 whisky drinkers had increased abundance of *Lactococcus* and *Streptococcus* (fold change log 2: 9.1827 & 4.2986; $p < 0.002$) compared to the non-drinker group. The butyric acid producing genera, *Ruminococcaceae* was found to be decreased in both the whisky drinking cohorts (fold change log 2: -1.5449 & -2.7327, respectively; $p < 0.002$). Short-chain fatty acids (SCFA), mainly butyric acid, acetic acid and propanoic acid were found to be decreased in both the whisky drinker groups in comparison to the non-drinkers ($p < 0.05$). The differential effects of whisky types with equal alcohol content indicate that constituents of whisky other than the alcohol also influence the gut bacterial composition.

References

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