

## Alcohol consumption, the microbiome, and hangover severity

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**Introduction:** The alcohol hangover is defined as the combination of negative mental and physical symptoms which can be experienced after a single episode of alcohol consumption, starting when blood alcohol concentration (BAC) approaches zero. Alcohol metabolism, i.e. the rate of conversion of ethanol into acetaldehyde, may be influenced by oral microbiota. The purpose of this study was to examine changes in microbiota after a heavy drinking session, and relate these to the severity of next day alcohol hangover.

**Methods:** N=15 healthy young adults (18-30 years old, 8 females) participate in the study, consisting of a hangover day (alcohol consumed) and a control day (no alcohol consumed). Saliva samples were collected on both test days, and the presence of various microbiota was assessed. Hangover severity was assessed with a single-item scale ranging from 0 (absent) to 10 (extreme).

**Results:** Participants consumed a mean (SD) of 12.4 (4.4) alcoholic drinks, and had an estimated peak blood alcohol concentration (BAC) of 0.20 (0.07)%. Mean (SD) hangover severity was 6.1 (1.1). The relative abundance of *Rothia*, *Streptococcus*, and *Veillonella* were significantly increased on the alcohol day compared to the control day. The relative abundance of *Prevotella*, *Fusobacterium*, *Campylobacter*, and *Leptotrichia* were significantly decreased. The abundance of *Rothia* was (after controlling for estimated BAC) significantly and negatively correlated with reported hangover severity ( $r = -0.564$ ,  $p = 0.036$ ).

**Discussions and Conclusions:** A significant negative correlation was found between *Rothia* abundance and hangover severity. Future studies should confirm this finding in a larger study sample.

**Implications for Practice or Policy:** The observation that the constitution of the oral microbiome is related to the severity of alcohol hangover contributes to the understanding of the pathology of the alcohol hangover, and may guide the development of effective and safe hangover treatments.

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