

To be submitted as a poster to ESBRA 2015

L-CYSTEINE (ACETIUM) LOZENGE EFFECTIVELY ELIMINATES CARCINOGENIC ACETALDEHYDE FROM SALIVA

Heidi Sundelin¹, Panu Hendolin², Lea Paloheimo², Pertti Kaihovaara², Leif Kronberg¹ and Mikko Salaspuro³

¹Laboratory of Organic Chemistry, Åbo Akademi University, Turku, Finland, ²Biohit Oyj, Helsinki, Finland, ³Research Unit and Acetaldehyde and Cancer, University of Helsinki, Helsinki, Finland

Introduction: Acetaldehyde that is present in alcoholic beverages or formed endogenously from ethanol is a Group 1 human carcinogen. One daily drink, or 10 g of ethanol, significantly increases the risk for oral cancer. A single sip of an alcoholic beverage causes exposure to carcinogenic concentrations of acetaldehyde in the oral cavity. In the presence of L-cysteine acetaldehyde is converted to inactive 2-methyl-1,3-thiazolidine-4-carboxylic acid (MTCA). L-cysteine lozenge effectively eliminates acetaldehyde from saliva during smoking.

Aims: To assess the effect of L-cysteine lozenges on salivary ethanol, acetaldehyde, L-cysteine and MTCA concentrations after sipping of strong alcoholic beverages containing varying levels of acetaldehyde.

Methods: Trial 1: Subjects took one Acetium lozenge (3mg of L-cysteine) 5 min before rinsing their mouths with 5 ml of water, vodka or grappa for 5 seconds. Trial 2: Subjects took one lozenge 5 min before and another immediately after alcohol sipping. Saliva samples were collected for 32 minutes.

Results: Trial 1: One L-cysteine lozenge resulted in a peak salivary L-cysteine concentration of $596 \pm 183 \mu\text{M}$ at 2 min and L-cysteine remained present in saliva for 8 minutes. The peak of salivary MTCA at 2 min was $129 \pm 56 \mu\text{M}$ and MTCA remained in saliva for up to 16 minutes. Trial 2: Acetaldehyde exposure in the oral cavity was decreased by 87.5 % ($p = 0.0012$) after sipping of grappa containing $5344 \mu\text{M}$ of acetaldehyde. **Conclusions:** L-cysteine (Acetium) lozenges effectively eliminate ethanol derived carcinogenic acetaldehyde from saliva by converting it to inactive and unabsorbable MTCA.