

Incorporation of ethyl glucuronide in hair of abstainers, social drinkers, heavy drinkers, and alcohol dependents. Comparison with usual markers of chronic alcohol abuse

Summary

Alcohol consumption and its numerous consequences for individual and public life still present a major persisting problem of public health in Switzerland. Several biological markers of alcohol abuse have been validated by the scientific community. Nevertheless, these markers often show a lack of sensitivity or specificity and demand repeated invasive blood sampling over months.

Ethyl glucuronide (EtG) is one of the most promising direct markers of alcohol consumption behaviour. Already in routine application as short-term marker in urine in withdrawal treatment, the first few publications have suggested its usefulness as a long term ethanol intake marker in hair. However, its incorporation into hair in relation to ethanol intake has not yet been carefully investigated and the proposed cut-off is strongly debated within the scientific community.

The submitted project wants to evaluate the usefulness of EtG as a direct long-term marker of alcohol drinking behaviour. For this purpose, 200 volunteers, representing in equal distribution the different groups of ethanol consumption, and 50 patients in withdrawal treatment from the Centre of Alcohol Treatment (CTA), should be recruited during two years for a three month-test phase. The past ethanol intake history will be evaluated in an interview using the Alcohol Use Disorder Identification Test (AUDIT) at the beginning of the study. As a result, the volunteers would also be grouped in order to have about 50 volunteers in each of the consumption groups abstainers, social drinkers as well as heavy drinkers.

The usual markers (CDT, GGT, ASAT and ALAT) and EtG will be determined in blood and in hair, respectively, at the University Centre of Legal Medicine in Lausanne. Blood and hair samples will be collected at the first interview and after three months. Two additional blood samples will be taken after one and two months. During the study phase, each volunteer will be asked to note his daily consumption in a *daily alcohol self-monitoring log*. In contrast, the CTA patients will be asked twice per week per telephone about their actual daily consumption until the end of the three month-test phase in order to guarantee the information as credible as possible. At the end of the test phase, volunteers and CTA patients will be interviewed again using the AUDIT questionnaire in order to cross-validate the obtained laboratory results and the reported daily alcohol consumption.

Statistical methods will be used in order to compare obtained EtG hair concentrations with results of the traditional blood markers and with information from the daily alcohol self-monitoring log or telephone interviews. Finally, a cut-off value for EtG in hair would be established. EtG would be used routinely as a marker for alcohol consumption during control of abstinence in cases of driving license withdrawal, probation period, pregnancy, for work place drug testing, or for interpretation of post-mortem questions. Use of EtG for routine applications could also reduce personal efforts for the customers during long-lasting control phases, save costs for laboratory analysis and offer a non-invasive hair sampling instead of multiple invasive blood withdrawals.