Positive EtG findings in hair as a result of a cosmetic treatment

Frank Sporkert, Hicham Kharbouche, Marc P Augsburger, Clementine Klemm & Markus R Baumgartner

In a case of a driving ability assessment, hair analysis for ethyl glucuronide (EtG) was requested by the authorities. The person concerned denied alcohol consumption and did not present any clinical sign of alcoholism. However, EtG was found in concentrations of up to 910pg/mg in hair from different sampling dates suggesting an excessive drinking behavior. The person declared to use a hair lotion on a regular basis. To evaluate a possible effect of the hair lotion, prospective blood and urine controls as well as hair sampling of scalp and pubic hair were performed. The traditional clinical biomarkers of ethanol consumption, CDT and GGT, were inconspicuous in three blood samples taken. EtG was not detected in all collected urine samples. The hair lotion was transmitted to our laboratory. The ethanol concentration in this lotion was determined with 35g/L. The EtG immunoassay gave a positive result indicating EtG, which could be confirmed by GC-MS/MS-NCI. In a follow-up experiment the lotion was applied to the hair of a volunteer over a period of six weeks. After this treatment, EtG could be measured in the hair at a concentration of 72pg/mg suggesting chronic and excessive alcohol consumption. Overnight incubation of EtG free hair in the lotion yielded an EtG concentration of 140pg/mg. In the present case, the positive EtG hair findings could be interpreted as the result of an EtG containing hair care product. To our knowledge, the existence of such a product has not yet been reported, and it is exceptionally unusual to find EtG in cosmetics. Therefore, external sources for hair contamination should always be taken into account when unusual cosmetic treatment is mentioned. In those cases, it is recommended to analyze the hair product for a possible contamination with EtG. The analysis of body hair can help to reveal problems occurring from cosmetic treatment of head hair. As a consequence, the assessment of drinking behavior should be based on more than one diagnostic parameter.

type: journal paper/review (English)
date of publishing: 20-10-2011
journal title: Forensic Sci Int (218/1-3)
ISSN electronic: 1872-6283
pages: 97-100