

THC-COOH in hair - a reliable marker of chronic cannabis use?

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Aim: Cannabis remains the most commonly used illicit drug worldwide, and the extent of chronic use could be revealed by hair analysis. The incorporation of cannabinoids in hair during cannabis use is low, however, and even regular cannabis users are frequently testing negative for THC in hair. Additionally, THC analysis in hair can be influenced by external contamination. The primary THC metabolite, 11-nor-9-carboxy-THC (THC-COOH), therefore represents a better analytical alternative, although concentrations are lower. The relation between extent of use and concentrations of THC-COOH is previously sparsely studied. The aim of this study was to investigate concentrations of THC-COOH and THC in relation to use in chronic heavy users of cannabis.

Methods: Sixty volunteers were included in the study after signing informed consent. Most subjects were male (68%) and the median age was 39 years (range 20-68). Median BMI was 22.6. The median number of days in a typical week with use of cannabis was 6, the median number of joints on a typical day was 3 and the median number of joints per week was 16. Ten subjects (16.7%) reported cosmetic hair treatment. After a washing procedure, analysis of THC-COOH was performed in the proximal 3 cm hair segment using a GC/MS-MS method (LOQ 0.10 pg/mg). Results from THC analyses are not presented in this abstract.

Results: THC-COOH was detected in 51 of the subjects (85%) above the LOQ. The median concentration of THC-COOH was 0.95 pg/mg and the range was 0-24.3. In those reporting use of more than 25 joints per week, THC-COOH was detected (above LOQ) in all subjects. The median ratio between the concentration of THC-COOH and number of joints per week was 0.07 (range 0-1.43). In a multi variate regression analysis, correcting for age, sex, BMI and cosmetic hair treatment, there was a significant relation between the concentration of THC-COOH and the number of joints used per week (standardized Beta=0.66, $p < 0.001$).

Conclusion: The present study showed that THC-COOH is detected in most chronic users of cannabis. We also observed a significant relation between the concentration of THC-COOH in hair and the number of joints used per week.