



K11 Urinary Elimination of 11-Nor-9- Carboxy- Δ^9 -tetrahydrocannabinol in Cannabis Users During Continuously Monitored Abstinence

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Attendees will learn about urinary elimination of 11-nor-9-carboxy- Δ^9 - tetrahydrocannabinol (THCCOOH) from cannabis users that self-reported weekly to daily use. These urine specimen data describe parameters pertinent to cannabis elimination.

Four inpatient studies of cannabis users (N=60; 6,158 individual urine specimens) were performed at the NIDA IRP with the objectives of examining the time course of THCCOOH elimination in urine. Protocols were approved by the NIDA IRB and each volunteer gave written informed consent. Subjects resided on a closed research unit under continuous medical surveillance. Individual urine specimens were collected *ad libitum* for up to 30 days. Volunteers consisted of 50 African Americans, 5 Caucasians, 3 Hispanics, 1 mixed race, and 1 American Indian. There were 46 male and 14 female participants ages 20 to 42 years. All self-reported cannabis dependence or use, and had a positive urine cannabinoid specimen to support exposure.

Specimens were screened by immunoassay with values ≥ 50 ng/mL classified as positive for cannabinoids. Urine specimens were confirmed for THCCOOH by gas chromatography/mass spectrometry (GC/MS) following base hydrolysis and liquid-liquid extraction. The limit of quantification was 2.5 ng/mL. Cannabinoid GC/MS concentrations (ng/mL) were normalized to the urine creatinine concentration (mg/dL) to account for the state of hydration and reduce variability with the final normalized units expressed as ng/mg. In 60%, the maximum normalized concentration occurred in the first urine specimen. In the other 40%, peak THCCOOH concentrations occurred as long as 2.9 days after admittance.

Data were divided into three groups, 0 - 50, 51 - 150, and >150 ng/mg, based on the normalized urine THCCOOH concentration in the first specimen after admittance. Mean $\pm$ SD, median and range of concentrations in the 0 - 50 ng/mg group (N = 19 subjects) were 23.7 ± 15.9 , 27.8, 0 – 47.3 ng/mg. Data for the other groups were 97.2 ± 22.6 , 96.1, 61.9 – 142.2 ng/mg and 339.8 ± 247.3 , 283.0, 155.1 – 1165.9 ng/mg, respectively for the 51 - 150 (N = 21 subjects) and >150 ng/mg (N = 20 subjects) groups. The mean intervals until the first negative specimen were 0.6, 3.2, and 4.7 days, respectively for the three groups. Mean % detection rates (percentage of positive specimens divided by total urine specimens for the day) on the day of the first negative specimen were 57.6, 73.4, and 79.8%, respectively. Mean times for the last positive urine specimen were 4.3, 9.7, and 15.4 days, respectively. The maximum time until the last positive urine specimen was 21.8 days for the 0 -50 ng/mg group, 25.3 days for the 51 – 150 ng/mg groups and 29.8 days for the >150 ng/mg group. These data reflect that the greater the initial THCCOOH concentration, the greater the interval until the first negative and last positive specimen.

These data will impact the field of forensic toxicology by increasing our understanding of cannabinoid elimination and improving interpretation of cannabinoid urine tests.

Cannabis Users, THCCOOH, Urine