

## RELATIONSHIP BETWEEN ON-SITE ORAL FLUID TESTING AND THC PLASMA CONCENTRATIONS IN MARIJUANA SMOKERS

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The study aim was to define the pharmacokinetic of delta-9-tetrahydrocannabinol (THC) and 11-OH-THC following two inhaled doses of cannabis and to evaluate the relationship between THC plasma concentrations and on-site oral fluid screening device Drugwipe 5S<sup>®</sup> in chronic and occasional marijuana smokers, 30 healthy male volunteers: 15 regular (1-2 joints/day) and 15 occasional (1-2 joints/week) consumers aged 18-34 were included. Blood concentrations of THC were measured after controlled inhalation of 10 mg or 30 mg. Blood samples were collected 5, 15, 30 minutes, 1, 2, 4, 6, 8, 10, 12 and 24 hours after the end of the joint, and an oral fluid test was carried out at the same times up to six hours with a final test at 24 h before leaving the study. First, a population PK analysis was performed using a non-linear mixed effects modelling. Then, the relationship between a positive oral fluid testing and several covariates was evaluated using a logistic regression analysis. For THC, the best base model used three-compartments with zero-order input and first-order output. The group had a significant effect on relative bioavailability (F1). Chronic cannabis users had a 2.41 times greater value of F1 than the occasional users. Dose achieved to non-linearity with a decrease by 0.68 of F1 for 30 mg compared to 10 mg. For 11-OH-THC, the model was a two-compartments with first-order input. The logistic model describing the probability of a positive oral fluid testing included the THC plasma concentrations (estimate 246, IC95: 169-547) and the group (estimate -1.81, IC95: -3.09- -0.78) with an intercept of -1.20 (-2.36- -0.47). This study described a non-linear relative bioavailability of THC with higher doses leading to a lower exposure. Further, with a same THC concentration, users who smoke cannabis occasionally have a higher probability to be screened positive compared to daily users.



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