Response to Dr Kintz’s Letter

In this letter, the author(s) propose(s) that ‘the quantitative findings of zolpidem after a single exposure do not fit in with our daily experience’ and that ‘Given the risk of misinterpretation of the data of Cui et al., the authors see no reason to support the findings of the Chinese group’.

Although markedly different from those reported by Villain et al. (1), the results appear. The method for the determination of zolpidem in hair was fully validated. In the same oral administration study, the peak zolpidem concentration in blood occurred 0.5–1 h following administration. The mean $C_{\text{max}}$ was 188.6 ± 87.5 ng/mL (2), which is similar to those observed in previous studies (3–5). And without melanin content factor, our results concerning concentration range and the time point of the peak 3 caused by incorporation via nail matrix were similar to those found by Madry et al. (6).

It is widely published and accepted that there is a high degree of biological variability in the relationship between dose and measured concentration in hair for drugs (7). As we mentioned in the paper, Villain et al. (1) did make a comparison between the incorporation of zolpidem into white and black hair. The concentration of zolpidem was found to be 0.4 pg/mg in the white part of the hair and 39.7 pg/mg in the black part of the hair. In Korea, Lee et al. (8) detected 0.4 ng/mg zolpidem in hair from a drug abuser who purchased the drug illegally through the Internet. In hair from another case, diazepam (lower than the limit of quantification), nortizepam (0.7 ng/mg) and zolpidem (0.7 ng/mg) were detected in hair from a medical doctor who abused drugs using forged prescriptions. The dosages and frequencies for zolpidem were unknown. In Japan, Miyaguchi (9) determined zolpidem in human hair using micropulverized extraction. The concentrations of zolpidem were determined to be 78.9–18,300 pg/mg in three actual (incurred) samples. With respect to the color of the hair, the concentration of zolpidem was 18,300 pg/mg in black hair and 119 pg/mg in white hair, although these samples were derived from the same donor.

We agree with Dr Kintz (10) that hair analysis is a suitable tool in documenting drug-facilitated crime cases. Owing to the significant variability in the time course of drug incorporation, the implementation of a ratio of concentrations between the segment corresponding to the event, based on a 1-cm/mo growth rate and the previous or the following segment, can be a useful tool to document the period of exposure and avoid inconclusive results to be presented to the judges. But using the concentration threshold and the minimal detectable dosage to document a single administration still remains an issue (11) because of biological variability.

Until these mechanisms of drug incorporation into hair are better understood and the reasons for the intersubject variability clarified, it needs further studies in the interpretation of the data to document drug-facilitated crimes.

References


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