Characterization and in vitro phase I microsomal metabolism of designer benzodiazepines - an update comprising adinazolam, cloniprazepam, fonazepam, 3-hydroxyphenazepam, metizolam, and nitrazolam

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Introduction

Designer benzodiazepines represent the latest class of new psychoactive substances (NPS). While other classes of NPS such as cannabinoid receptors agonists or synthetic cathinones are mainly consumed for hedonistic reasons, designer benzodiazepines may also be consumed for 'self-medication' by persons with anxiety disorders or by users of stimulant and hallucinogenic drugs (‘stand-by medication’ to counteract unpleasant overstimulation). In the present study, five benzodiazepines and one thienodiazepine offered as research chemicals on the Internet were characterized and their main in vitro phase I microsomal metabolites identified. The information obtained can be used to update analytical methods for the detection and identification of benzodiazepines in biological samples.

Workflow

1. Product Monitoring
   - Research chemicals
   - Tablets
   - Metizolam
   - NMR
   - LC-Q-ToF-MS
   - LC-MS/MS
   - GC-MS

   All products were obtained via Internet shops in 2015

2. Characterization
   - The project was funded by the ‘Prevention of and Fight against Crime’ program of the (DAAD) for covering the travel expenses to the 54th annual meeting of the TIAFT in Brisbane, Australia.

3. In vitro phase I microsomal metabolism
   - Pooled human liver microsomes (pHLM) incubation
   - Formation of clonazepam and its metabolite 7-aminoclonazepam is particularly important for the interpretation of analytical findings, as detection of these compounds might be misinterpreted as resulting from clonazepam uptake.
   - The detected in vitro metabolites after pHLM incubation, N-desmethylandazolam and N-didesmethylandazolam, were in accordance with the main metabolites described in the literature.

   - Adinazolam
   - Cloniprazepam
   - Metizolam
   - Nitrazolam

  propagation of research chemicals and their metabolites, in accordance with the main metabolites in vivo as well as assessment of the structural formula of the various metabolites and their metabolites, in accordance with the main metabolites described in the literature.

   - Conclusion
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Detailed analytical information can be found: Moosmann et al. Characterization and in vitro phase I microsomal metabolism of designer benzodiazepines - an update comprising adinazolam, cloniprazepam, fonazepam, 3-hydroxyphenazepam, metizolam, and nitrazolam. J Mass Spectrom, accepted for publication.