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Oxymetholone and desoxymethyltestosterone: how many metabolites do we know? HPLC clean-up to identify the new targets

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Abstract

The metabolism of two anabolic steroids – oxymetholone (OXM) and desoxymethyltestosterone (DMT) – was reinvestigated to identify new targets potentially valuable for the antidoping analysis. The special interest to the 17-methyl steroids is due to their unique ability to produce 18-nor-17-hydroxymethyl metabolites, which may excrete much longer compared to metabolites with the unmodified or hydroxylated D-ring.

Following fractionation of the urinary extract by means of high performance liquid chromatography, each fraction was subjected to gas chromatography-mass spectrometry and gas chromatography-tandem mass spectrometry (GC-MS/MS) analysis after trimethylsilylation. About 20 steroid metabolites were found for DMT and more than 40 for OXM, with many of them being isomeric compounds. In addition to the well-known reduced and hydroxylated metabolites, 18-nor-17,17-dimethyl and 18-nor-17-hydroxymethyl-17-methyl steroids were tentatively identified. Having evaluated all the metabolites in terms of how long they could be detected in the excretion urine samples provided by three volunteers, we suggest that 18-nor-2 ξ ,17 β -hydroxymethyl-17 α -methyl-5 α -androst-13-en-3 α -ol is an important marker of OXM abuse.

In case of DMT, where excretion urines from a single volunteer as well as several spot urines were at our disposal, better detectability was achieved when 18-nor-17,17-dimethyl-5 α -androst-13-en-2 ξ ,3 α -diol was monitored. It should be noted that for DMT no steroids to which 18-nor-17-hydroxymethyl-17-methyl structure could be unambiguously attributed were found.

The novel metabolites of OXM and DMT could be detected using GC-MS/MS at least for 14 days after administration of these anabolic steroids compared to the period of 5–7 days for previously reported metabolites.

For the complete paper, please refer to:

Sobolevsky T, Rodchenkov G: Mass spectrometric description of novel oxymetholone and desoxymethyltestosterone metabolites identified in human urine and their importance for doping control. *Drug Test. Analysis* **2012**, 4, 682-691