

Methylnoretiocolanolone Sulfate – Long-Term Metabolite of Methylnortestosterone (17 α -Methylnandrolone)

VICTOR P. URALETS and STACY A. SWEENEY,

Quest Diagnostics, 4230 Burnham Avenue, Las Vegas, Nevada 89119, USA

Methylnortestosterone (Estr-4-en-17 α -methyl-17 β -ol-3-one) [I] is a new designer anabolic steroid banned in sports by the World Anti-Doping Agency (WADA) in 2006. Excretion study with I was performed.

AIM: identify urinary metabolites, develop detection procedure.

RESULTS: Methylnortestosterone appears to follow metabolism of the common anabolic steroids, such as testosterone, 19-nortestosterone and 17 α -methyltestosterone. Four isomeric A-ring reduced metabolites are detected. Based on GC/MS data and analogy with similar steroids, metabolites are tentatively identified as: 5 α -estran-17 α -methyl-3 α ,17 β -diol [II]; 5 β -estran-17 α -methyl-3 α ,17 β -diol [III]; 5 α -estran-17 α -methyl-3 β ,17 β -diol [IV]; and 5 β -estran-17 β -methyl-3 α ,17 α -diol [V]. Additional 16-hydroxylated metabolite [VI] was also found.

Metabolites IV and VI are sulfate conjugated in urine. Metabolites II, III and V appear as glucuronides and sulfates. Glucuronides prevail over sulfates during earlier stages of excretion. However, after two days it reverses.

CONCLUSION: Methylnoretiocolanolone (5 β -estran-17 α -methyl-3 α ,17 β -diol [III]) has been the most abundant metabolite. It can be detected in urine for 5 days after a single oral dose (10 mg) using a standard anabolic steroid GC/MS procedure, which looks for steroid glucuronides. Detection window can be extended when extraction procedure includes solvolysis of steroid sulfates. In this case, III can be detected for at least 10 days. Figure shows relative abundance (log. scale) of methylnoretiocolanolone glucuronide vs. sulfate over time.

Corresponding author: Victor.P.Uralets@questdiagnostics.com