

ACMD

Advisory Council on the Misuse of Drugs

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Dear Minister,

I am writing to provide you with the Advisory Council on the Misuse of Drugs' (ACMD) consideration of the anabolic steroid estra-4,9-diene-3,17-dione, which is also known by the following chemical names: dienedione , 19-norandrosta-4,9(10)-diene-3,17-dione and 19-nor-4,9(10)-androstadienedione.

Anabolic steroids are synthetic substances which are related to the male sex hormones, particularly testosterone. These substances have a number of physiological effects, most notably anabolic effects (such as growth of skeletal muscle and bone) and androgenic effects (the differentiation, growth and maintenance of the reproductive system and sexual characteristics in males). The correct term to describe anabolic steroids is anabolic-androgenic steroids; however, they are commonly referred to as anabolic steroids.

The Advisory Council on the Misuse of Drugs (ACMD) has, at the request of UK Anti-Doping (UKAD), and supported by the Home Office, reviewed the World Anti Doping Agency (WADA) Prohibited Lists over the years, to consider those drugs included in the List, where there may also be harms commensurate with the Misuse of Drugs Act 1971.

The ACMD's Technical Committee in July and October 2015 reviewed the 2016 Prohibited List. In addition, UKAD specifically requested consideration of estra-4,9-diene-3,17-dione, which is not controlled by the Misuse of Drugs Act, 1971. WADA prohibits estra-4,9-diene-3,17-dione as an anabolic androgenic steroid (AAS) based

on the fact that it has a similar chemical structure to the anabolic agent trenbolone (which is listed under section 1 (Prohibited List) as an AAS).

Estra-4,9-diene-3,17-dione has been shown to be metabolised *in vitro* to 17-hydroxy-estra-4,9-dien-3-one (Scarth 2010). This metabolite is controlled by the Misuse of Drugs Act, 1971 Class C (Schedule 2, Part 3, paragraph (c) and sub-paragraph (iii)), as it is structurally derived from 17-hydroxyestrane-3-one by unsaturation in the carbocyclic ring system.

UKAD have evidence for the availability of estra-4,9-diene-3,17-dione through detection of the metabolite, 17-hydroxy-estra-4,9-dien-3-one, in urine samples of two athletes. The presence of the metabolite was attributed to the ingestion of a dietary supplement.

A recent survey of products suspected of containing anabolic steroids and sold in fitness equipment shops in the UK showed that estra-4,9-diene-3,17-dione was putatively identified in four products, namely Trenabol-V, Epivol, X-Tren and Super Tren-MG (Abbate 2014).

Estra-4,9-diene-3,17-dione was classified in the US as an anabolic steroid under The Anabolic Steroid Control Act 2004, as it was shown by the Drug Enforcement Agency to be chemically and pharmacologically related to testosterone. As such, it became a controlled substance in the US on January 4, 2010, and is classified as a Schedule III anabolic steroid under the United States Controlled Substances Act.

The ACMD has carefully considered the potential physical and social harms of estra-4,9-diene-3,17-dione and advises that these would be commensurate with other anabolic steroids. The ACMD therefore recommends that estra-4,9-diene-3,17-dione be controlled under the Misuse of Drugs Act 1971 in Class C and as a Schedule 4 (IV) Part 2 substance under the Misuse of Drugs Regulations 2001, so as not to preclude legitimate use on prescription.

As in its previous advice on anabolic steroids, the ACMD is mindful of its responsibilities under the Misuse of Drugs Act 1971, its recommendation for classification of this anabolic steroids (listed above) potentially associated with sport, body building and image enhancement is based on: i) demand reduction; ii) harm minimisation, and; iii) reduction of supply.

Yours sincerely



**Professor Les Iversen
(Chair of ACMD)**

References

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