Psychotropic side-effects of anabolic steroids

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AIMS: Anabolic-Androgenic Steroids (AAS) are abused both in high level-sports and in mass sports like leisure sports. The motivation and the attitude of this drug abuse as well as the biomedical side effects of anabolic steroids are widely documented. Here we report on the rather neglected issue of their psychotropic effects.
In this regard it has to be taken into account that for doping purposes anabolic steroid hormones are frequently taken in supraphysiological doses. Abuse of supraphysiological doses usually taken during the so called "stacking" periods – lasting for weeks and several times a year – display these effects more explicitly, but the link between abuse of AAS and psychotropic effects is still under discussion.

METHODS: Therefore we analyzed scientific databases (e.g. Medline, Spolit) focusing on the description of psychotropic effects correlated to AAS intake. The hits and also related articles detected in review articles, together more than 70 original papers including more than 1000 test persons were evaluated.

The papers were specified into three categories:
- Clinical trials with Abusers and Non-Abusers or defined administration of AAS (84 treated out of 102 volunteers)
- Field studies in fitness clubs comparing the frequency and severity of psychotropic side effects between abusers and non-abusers of AAS (480 abusers out of 1285 interviewed)
- Case-studies, medical observation and follow-up monitoring (70 abusers).

RESULTS: To identify the psychotropic effects the "Diagnostic and Statistical Manual of Mental Disorders" criteria and other evaluated specific questionnaires were widely used testing the psychological inventories.
The most frequently used methods to examine psychotropic effects by now are to ask the abuser about the abused substance and diagnose the psychotropic effect by a standardized questionnaire. In field and case studies this comprises a high grade of uncertainty because of the mixtures of AAS usually consumed during „stacking" and the uncertain nature of the preparations administrated (unreliable sources of supply).
During clinical trials like application studies the administered doses have to be ethical maintainable and therefore have to remain far from the supraphysiological doses, meaning that they can show only weak effects.
Psychotropic effects like mood alterations, enhanced aggression, depression, some forms of psychoses and dependence are considered to be linked to the abuse of AAS by all papers retrieved by our research except one.

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The most frequently examined but still controversially discussed psychotropic effects are aggression and depression. A kind of dependence is also not rarely reported. While the alkylation on C-17 position of the steroid and liver toxicity are closely related no evidence of a correlation between a derivative of testosteron and a special psychotropic effect is described.
The authors have also generated data indicating that AAS may stimulate aggression and libido in appropriate animal models (orchiectomized rats) which are in accordance with the literature data generated in humans.

CONCLUSIONS: Field studies may be more significant if samples of the abused substances will be analyzed before abuse and/or urine-samples will be taken from the volunteer after intake to identify the abused substance as far as possible by interpreting the pattern of the analyzed metabolites.
Further approaches are biological and pharmacological experiments regarding the correlation of AAS, central nervous receptors and behaviour. It becomes evident that AAS may induce strong psychotropic side effects: Psychotropic side effects are dangerous not only for the abuser but even for the social environment. Further research seems necessary to describe the overall relevance of the side effects of AAS to human health.

KEYWORDS: *Anabolic Steroids, Substance abuse, Aggression, Dependence, Depression*

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