Project Review

"Nutritional supplements. Still a risk for inadvertent doping?"

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In some sports about 100% of athletes take nutritional supplements (NS) without any reflection of the risk/benefit relation. One of the risks connected with the use of NS is the risk of inadvertent doping originating either from contaminated or faked NS.

An international IOC study performed in 2002 has shown that about 15% of non-hormonal nutritional supplements contained anabolic androgenic steroids (mainly prohormones) not declared on the label. Since that time athletes have been warned by their federations, information systems have been established, legislation towards anabolic-androgenic steroids as nutritional supplements has been changed e.g. by the anabolic steroid act 2004 in the USA and some companies have improves their quality control systems. The question is: has the situation on nutritional supplement market improved or got worse?

To answer this question on an international level an extended follow-up of the 2002 IOC study should be performed. NS from different countries and from internet sources should be purchased and analysed for prohormones, classic anabolic steroids, new designer steroids, β2-agonists and stimulants. The results should be used to educate athletes to reduce the non-reflected use of NS, to force the industry for the improvement of quality control systems for NS and to motivate governmental institutions to regulate and restrict the market for NS.

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Results and Conclusion

Previous studies have shown that supplements may be contaminated with anabolic-androgenic steroids so that these supplements present a considerable risk of inadvertent doping for athletes involved in a doping-control system. The purpose of the present study was to investigate the international supplement market for an update on the contamination rate of nutritional supplements.

A total of 597 supplement samples were obtained from 17 countries and from the Internet. Samples were analyzed for presence of 43 different anabolic-androgenic steroids by gas chromatography/mass spectrometry and liquid chromatography/mass spectrometry. For most substances, the limit of detection was in the range of 10-50 ng/g or lower. In four samples, the presence of a prohibited substance was confirmed (Androsta-1,4-diene-3,17-dione (twice), DHEA, and Androsta-1,4,6-triene-3,17-dione). A total of 561 samples were found to be negative of the selected anabolic agents and in 32 samples, no analytically acceptable result was obtained.

The present results indicate that the prevalence of supplement contaminations has decreased in recent years. Nevertheless, supplement contaminations and adulterations still present a risk of inadvertent doping to athletes who are involved in a doping-control system. Further studies are necessary to identify the risk of contamination for further prohibited substances.