

Anti-Doping Awareness in Sports

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Lecture -38

Safe Supplement Use

Good morning, ladies and gentlemen. Welcome to Lecture 3 of Week 8 of this course on Anti-Doping Awareness for Sports. I am Colonel Dr. Anup Krishnan, and today we will be talking about safe supplement use. I will be covering this topic as per the following outline: introduction, we'll talk about the WADA prohibited list, we will talk about contaminated supplements, supplement safety, we will try and answer some questions, we will talk about the best practices to be followed if you are an athlete or an athlete support personnel, and what the National Anti-Doping Agency has to say about supplements, and conclusion. Supplements can enhance performance, but improper use can lead to health and legal issues. Athletes should prioritize safety and make informed choices.

Right. So I have put this slide just to remind everybody that this is the sword of Damocles hanging over the neck of all the athletes and all the athlete support personnel who are working with sportspersons. Each of us should be aware of this, and each of us should be aware of the prohibited methods. I will draw your attention to Category S0.

Now the problem with Category S0, particularly with countries like India and China who have an indigenous system of medicine, is this: Category S0 means these substances are not approved for human use. Now the problem is, Indian and Chinese herbal medicines are not approved for human use in several western countries. Especially Ayurvedic medicines; you cannot use, prescribe, and consume Ayurvedic medicines in several countries in Europe and America. You can only use oils and things like that. You cannot consume medication. So, if an athlete is consuming herbal supplements or Ayurvedic or Chinese herbal medicines and gets tested in a western country, and there is an adverse analytical finding reported, it is highly likely that the athlete will get an anti-doping rule violation because of this particular category. So we should be very careful as far as giving herbals to athletes.

Yeah, let's talk about some studies. There was a study funded by the IOC which analyzed 634 products which were labeled as non-hormonal nutritional supplements from 13

countries and 215 different suppliers. So it is not limited to one country, right? 634 products labeled as non-hormonal from 13 countries and 215 suppliers. 94 products contained anabolic steroid precursors which were not declared on the label. 23 products contained steroid precursors of nandrolone and testosterone. 64 products contained steroid precursors of testosterone, and 7 products contained steroid precursors of nandrolone only. So approximately 200 products out of 634, which were labeled as non-hormonal nutritional supplements, were found to contain anabolic steroids: nandrolone, testosterone, and nandrolone. So this is how risky it is.

In South Africa, they found that 40% of 30 OTC supplements; OTC supplements are those supplements which are available without a prescription; and out of those, 40% contained banned substances. This is South Africa. Let's talk about another study by Pandemore et al.

Now, they tested so many supplements. They checked what was listed on the label and what they found. Listed on the label: Getu Cola or herbal tea brand. Inside: caffeine, ephedrine, pseudoephedrine, methyl ephedrine. Caffeine is a restricted drug as far as the WADA code is concerned. Ephedrine, pseudoephedrine, and methyl ephedrine are banned substances as far as the WADA code is concerned.

Cola extract, Ma Huang extract: found in the supplement; caffeine, ephedrine, pseudoephedrine, methyl ephedrine. Guarana extract, Mahuang extract: found, caffeine, ephedrine, pseudoephedrine, methyl ephedrine. Another Guarana extract, Mahuang extract: caffeine, ephedrine, pseudoephedrine, methyl ephedrine. Please note, these are sold as tea, herbal teas abroad. And it is very easy to get lured by the tea name on the label. They contain all of these substances, which are banned substances under the WADA code.

So please be careful when you are prescribing herbals to athletes. Similar study; listed on the label: something else, and they found so many pro-hormones in the nutritional supplements. Listed on the label: branched-chain amino acids. Found: 4-androstenedione, found DHEA. These are all precursors of hormones, and these hormones are banned. So their precursors are also banned as per the WADA code.

Tribulus is a very commonly used herbal supplement by athletes who are indulging in power sports. But see what was found: precursor. Another review article: 447 studies found substances prohibited by WADA were found in most of the supplements analyzed, including pro-hormones and stimulants. The rates of contamination were between 12 and 58%. That means up to 60% of supplements are contaminated. Athletes and coaches must be aware of contaminated supplements.

Another study: some supplements contain excessive doses of potentially toxic ingredients, while others do not contain significant amounts of the ingredients listed on the label. That means there were a lot of potentially toxic ingredients in high doses, and there were a lot of ingredients which were not listed on the label. And there were a lot of ingredients which were listed, but the amounts were very insignificant. Legitimate dietary supplements on sale contained ingredients that are not declared on the label but are prohibited by the WADA regulations. This is also common. So contamination of dietary supplements should be kept in mind.

The contaminants include a variety of anabolic androgenic steroids including testosterone and nandrolone, as well as the prohormones of these compounds, ephedrine and caffeine. Probably these are the result of poor manufacturing practices, but there is some evidence of deliberate adulteration of steroids. So be very careful about using supplements.

Another review article: they reviewed 18 years of doping cases. They found that in 26%, the athlete claimed that a dietary supplement was the source of the prohibited substance, causing the adverse analytical finding. So, in 26% of cases, the athlete claimed that a dietary supplement was the source of the prohibited substance which caused the adverse analytical finding. Evidence was found in about 14% of cases. Stimulants were the most prevalent group, of which methylhexanamine was found in 16 cases. And high-risk products were predominantly multi-ingredient pre-workout supplements and fat-burning products.

So there are several supplement safety issues which we must be aware of: possible adulteration of the product with hidden drugs, contamination from heavy metals, pesticides, solvents, or microbiological agents. The label claim and ingredients may not be authentic. And there are a lot of spurious and fake supplements in the market, especially in a country like India, because there is no regulation on these supplements.

So what is the answer? The answer is something called third-party certification. There are several agencies such as the Banned Substances Control Group, Informed Sport, NSF Certified Sport, and USP. These are independent agencies which function abroad, and they test these supplements and tell you whether they contain any contaminants or any substances which are banned under the WADA code. BSCG, LGC, and NSF also ensure that a product has been tested for and does not contain ingredients banned by WADA. So these are more reliable agencies, out of which BSCG is said to be the gold standard of third-party certification. USP does not test for substances banned in sport, but they do verify the ingredients and their amounts in the products. So USP only certifies the ingredients which are there and their quantities. It does not test for banned substances.

So there are certain questions which come into the mind of everybody who is involved with sport and with dope-free certifications. So, let's take them one by one. Can NDTL,

NADA, WADA test supplements and certify as dope-free? NDTL is the National Drug Testing Laboratory. No, NDTL, NADA, and WADA cannot test supplements and certify as dope-free. Can any Indian laboratory certify supplements as dope-free? No, not yet. Can any international laboratory certify supplements as dope-free? Yes, we did discuss that in the previous slide. There are certain international reputed organizations which test and certify the supplements as dope-free.

How often do the products need to be tested as dope-free? Every batch of the product manufactured needs to be tested for dope-free certification. Every batch which is manufactured, a sample is sent to these organizations. They test them. They give a certificate saying that this particular batch of this particular supplement is certified dope-free, and then only that batch can be sold as certified dope-free.

Who is responsible if products are found to contain banned substances; manufacturer, supplier, coach, or the athlete? It's obviously only the athlete, because WADA or the National Anti-Doping Organization will only hold the athlete responsible. Can athletes test the products for dope-free? Unfortunately, no. Are dope-free certified products available in India? Yes. There are a couple of companies which are selling dope-free certified products in India; quite reputed companies.

So what are the best practices for safe supplement use? Always focus on natural food first. Ensure your diet is balanced before considering supplements. Always consult a sports physician or a sports nutritionist before using any supplement. Please be clear, supplements should be prescribed. Third-party testing: only choose products which are tested by trusted third-party organizations and certified as dope-free. Procurement: try and procure the supplement directly from the manufacturer or from the authorized dealer only. Nobody else, because then only you can be sure about the quality. Then only you can be sure nobody has opened the sealed package and substituted the dope-free supplement with something else.

Education: very important. Athlete support personnel should be educated on proper nutrition and the risk of overuse and contamination. So what does the National Anti-Doping Agency have to say about supplements? Check for specific warnings issued by sports organizations on the products. Read the literature completely. Be aware of the athletes' experiences, other athletes' experiences with the supplements. Be aware of the product and the manufacturer. Source the supplement from manufacturers or authorized dealers only. Do your own research through leaflets, internet, manufacturers' websites, etc. Take advice from third-party sports physicians, sports nutritionists, and reliable websites. Look at the general behavior, and please be very clear about the objective of the intake; why do you want to take this particular supplement?

Take-home message: safe supplement use can enhance performance if done correctly. Do not over-rely on supplements. They should complement, not replace, proper nutrition and training. Beware of contaminated products. Use certified dope-free supplements from reputable sources to avoid banned substances. Monitor the dosage properly. Make sure you stick to the recommended amounts to avoid health risks. Consultation, education, and using certified products are the key to minimizing risks of supplement use.

These are my references, ladies and gentlemen. Kindly go through them. There are also several websites and apps which are available which will help you to decide whether the supplement or the drug which you are using or about to use is safe for use by athletes. Thank you, ladies and gentlemen, for your attention and listening. Thank you and Jai Hind.