Dear Alice,

My question is about nutritional supplements, specifically androstenedione and its closely related cousins. I have a five-day-a-week workout routine, and I have been searching for a supplement that will give me the greatest benefit for all of that hard work. I am, however, very concerned about the negative effects of some of these unregulated supplements. My question then is, what kind of side effects can I truly expect from using one of the male hormone precursors like androstenedione? And, in your opinion, is it safe?

Answer

Dear Reader,

It's great that you're considering what supplements you may be consuming and how they may impact your health. Androstenedione is a steroid hormone that's naturally produced by the adrenal glands, ovaries, and testes, and then converted to testosterone and estradiol (a type of estrogen). Historically, synthetic androstenedione was used to help boost hormone levels among those with decreased testosterone levels. Because of those properties, there were thoughts that androstenedione might increase muscle mass and injury recovery time. That being said, there’s no conclusive scientific evidence supporting these claims. In fact, further research found that although testosterone levels rose after the ingestion of androstenedione, they only remained elevated for a couple of hours, with peak levels lasting just a few minutes. In addition, the anabolic effects, which promote muscle building, were shown to be considerably less than those of testosterone produced naturally in the body. Further, it has a number of side effects on the body that can be not only undesirable but can cause serious health concerns. You concerns are warranted since given the negative effects associated with its use, it's classified as a Schedule III drug by the Drug Enforcement Administration and is illegal to use unless for specified medical purposes.

When androstenedione was first synthesized about 60 years ago, it was shown to have both androgenic (male hormone-like) and anabolic steroid-like (muscle building) properties, making it an anabolic androgenic steroid. Despite research showing its seemingly small impact, androstenedione became widely used as a supplement to increase testosterone levels and promote muscle development. It's good to know that in order for androstenedione to be
converted into another hormone such as testosterone, specific enzymes and hormones, among other molecules, must be readily available in the body. Therefore, simply introducing extra androstenedione into your system doesn’t automatically guarantee that all of the necessary players will be there to produce more testosterone. And even so, this increase may or may not improve the effects of intense physical activity habits. Beyond the early studies, rigorous scientific studies haven’t shown that androstenedione increases testosterone levels or improves the effectiveness of exercise regimens aimed at building muscle. The effects on testosterone are most often limited to increasing levels for those with low baseline testosterone levels such as women, older men, and people with hypogonadism (a condition characterized by inadequate production of sex hormones).

In terms of side effects, because androstenedione is an anabolic androgenic steroid, its effects are similar to those of testosterone-based anabolic steroids. The more serious side effects include increased risk for cardiovascular disease, certain cancers such as prostate cancer, and depression. In addition, there are sex-specific side effects that can both pose health risks and be undesirable for some.

For those assigned male at birth, side effects could include:

- Shrinking testes
- Increased hair loss
- Enlarged breasts
- Possible sterility (the inability to conceive children)

For those assigned female at birth, side effects could include:

- Shrinking breasts and uterus
- Enlarged clitoris
- Irregular menstruation
- Increased facial and body hair growth
- Deepening voice

Young children and adolescents are particularly susceptible to some of the adverse effects of exogenous (coming from outside the body) hormones. This is because they either haven’t started or are in the early stages of puberty. Excessive amounts of sex hormones such as testosterone and estrogen may induce premature puberty, cause early closure of bone growth plates, and lead to decreased adult height and altered stature. In fact, due to the many potential negative health effects, the Food and Drug Administration (FDA) has prohibited the sale of over-the-counter androstenedione and similar steroid-like dietary substances. Further, as with all dietary supplements, the FDA doesn't evaluate the effectiveness or safety of these products, so it can be hard to be sure of what you're actually getting.

As is the case with many types of supplements, it can be difficult to determine whether the benefits outweigh the risks. It comes down to looking at what results you want from the supplement, the chances that you will achieve those results, and the risk of unwanted side effects. The evidence thus far doesn’t suggest any recognized benefit of increased muscle development and shows there may be the chance of harm. As with any dietary supplement, it’s a good idea to talk with your health care provider before starting any new regimen. It’s possible
they can answer your questions and give you more detailed information with your needs and health history in mind.

Alice!
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