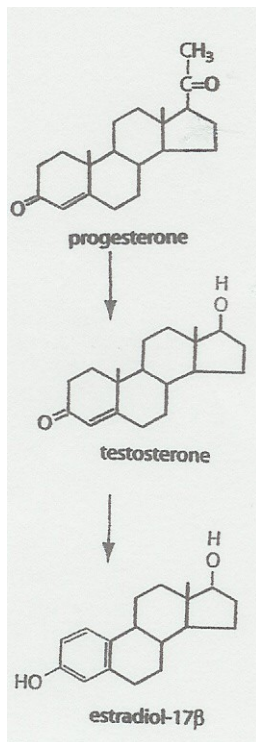


Girls on Steroids! The big news that is not news at all.

Joel Brind, Ph.D.

To paraphrase the classic film “Casablanca”, news media outlets were recently shocked, SHOCKED to find that middle school girls are using performance-enhancing steroids, just like the pro athletes. But why is this a surprise to a society in which doctors, school nurses, public health authorities, voluntary agencies and parents have been pushing teenage girls to take potent, synthetic sex steroids for decades? The answer is simple: most people simply do not know that that is exactly what those drugs benignly called “the pill” really are. Doctors and scientists refer more accurately to the active ingredients of contraceptive pills, patches, implants and injections as **contraceptive steroids**. It’s about time the general public knew exactly what serious drugs so many healthy young girls and women have been pumping into their bodies for so many decades now.

The term “steroids” refers to a large class of chemicals that are made from cholesterol, both natural derivatives that our bodies make, as well as those synthesized in pharmaceutical laboratories. All of these compounds have a “carbon skeleton” which is a 4-ringed structure of 18-21 carbon atoms bonded together, with a shape that resembles chicken wire. There are actually several subtypes of steroid hormones and intermediate compounds that our bodies make. There are the so-called mineralocorticoids and glucocorticoids made by the adrenal gland, which regulate salt balance and sugar balance, respectively. The glucocorticoids (The main natural one is hydrocortisone.) are also anti-inflammatory, and many such synthetic steroids are used to treat skin rashes, asthma, and transplant patients.



Then there are the sex steroids, of which there are three active types, made primarily by the gonads (testes and ovaries). A woman's ovaries make **progesterone** and **estradiol** (the main form of **estrogen**), and a man's testes make **testosterone**. (See diagram.) The way these three sex steroids are made by the body follows the Biblical sequence of creation. Specifically, a piece is chopped off of cholesterol's 27-carbon atom skeleton, leaving the 21-carbon steroid, progesterone. Progesterone is the "mother" hormone in two ways. First, it is required for motherhood, i.e., for the implantation of the embryo in the uterus and the construction and maintenance of the placenta. (Mifepristone or RU-486, the abortion pill, is a synthetic antiprogesterone steroid drug. By neutralizing progesterone, it induces an abortion.) Second, progesterone is the mother substance from which the other sex steroids are made. Thus, when a two-carbon piece is cut off of the 21-carbon progesterone, the 19 carbon steroid testosterone is made. Testosterone is the main androgen (i.e., makes a man) steroid. It is testosterone, rising at puberty, which turns the body of a boy into the body of a man. Finally, when a one-carbon "rib" is removed from the carbon skeleton of testosterone, the 18-carbon estradiol (estrogen) is formed. It is estradiol, rising at puberty, which turns the body of a girl into the body of a woman. Even though a man's body has very little estrogen around and a woman's body has very little testosterone around, the same biosynthetic sequence takes place in both men and women.

When we speak of "performance-enhancing" or "anabolic" steroids, we mean androgens, i.e., testosterone or synthetic steroid drugs which act like testosterone to build muscle mass. The term "anabolic" means that it causes tissue growth. In fact, estrogens are anabolic for breast tissue. When we speak of contraceptive steroids, we mean synthetic drugs that act like progesterone (called **progestins**) to prevent the development of eggs in a woman's ovary and ovulation. Both progesterone and estrogen are high in pregnancy, and so contraceptive steroid formulations typically contain both a progestin and an estrogen, in order to induce a state called "pseudopregnancy", in which ovulation cannot occur. The reason why "the pill" is composed of synthetic estrogen and progestin is that oral estradiol and progesterone would not work. This is because when anything is eaten and absorbed through the digestive tract, it first goes to the liver. One of the liver's many jobs is to inactivate (break down or metabolize) steroids. Hence, the steroids in "the pill" are designed to be resistant to the liver's efforts to metabolize them. That is why both the synthetic performance-enhancing androgenic steroids as well as the contraceptive steroids are toxic to the liver, and **increase the risk of liver cancer**.

The morning after pill (MAP or "emergency contraception") is comprised of the same steroids as the "pill", but in a much higher dosage. It acts in the same way as the "pill", to prevent ovulation and thereby prevent conception. (Although the manufacturers claim that the MAP can also prevent implantation of a conceived embryo, thus causing an early abortion, this is still an open question.)

Contraceptive steroids, since they are anabolic to the breasts, **also increase the risk of breast cancer**. In addition, they help to stimulate the growth of any abnormal cells in the cervix. Therefore, even though cervical cancer results from a sexually transmitted infection (STI) with human papilloma virus (HPV), **the risk of eventually developing cervical cancer is increased by contraceptive steroids**. It is also true that pseudopregnancy does confer at least some of the benefits of real pregnancy, at least in terms of **lower risk of ovarian and uterine cancer**, but these forms of cancer much rarer than breast and cervical cancer.

The bottom line is that “the pill” constitutes just a different type of serious, synthetic anabolic sex steroid that athletes sometimes use to build more muscle and thus enhance performance. Therefore, since taking those steroids seems so inherently wrong—so wrong as to make them unlawful, why on earth is there an effort to make contraceptive steroids—especially in their most potent form as MAP’s—available without even a prescription? Are we not sending our teenage kids the message that it’s wrong to take synthetic anabolic sex steroid drugs to enhance athletic performance, but it’s OK to take synthetic anabolic sex steroid drugs to enhance sexual performance? It would appear to be a ‘no brainer’ that the use of all of these drugs should be much more carefully evaluated than they are at present, to say the least.

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