Raising Hormones

Testosterone levels may offer clues to help resolve several vexing conditions

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Laboratory analyses of blood and other medical measurements, which help health practitioners make diagnoses and detect toxic effects of medication, can also help people with HIV track their health. Judith Rabkin, Ph.D., M.P.H., is professor of clinical psychology in psychiatry at the Columbia University College of Physicians and Surgeons in New York City. She and colleagues have done extensive research on testosterone treatment for people with HIV. Rabkin analyzes the testosterone levels of POZ founder Sean O. Strub.

Everyone knows that testosterone is the hormone that's key to the male sex drive, but for PWAs it can also be a matter of life and death. Growing evidence shows that testosterone deficiency can lead to impaired appetite, weight loss and decline of crucial lean body mass-all the ingredients for dangerous wasting. In addition, low levels of this hormone can produce a range of devastating quality-of-life problems: Besides the well-known loss of sexual desire, there is impotence (inability to get or maintain erections), low energy and depressed mood. And contrary to popular belief, women also have testosterone, though in lesser amounts than men, which is equally valuable for maintaining their health.

So for PWAs, testosterone measurement is very important-particularly for those like Sean with CD4 counts under 400, below which deficiencies of this hormone become especially common. A doctor can request this measurement as an add-on to standard blood work.

There are two kinds of measurements: *Total testosterone*, the total quantity in the body, and *free testosterone*, the amount available for actual use. Think of it like your bank account: While a newly deposited check is clearing, your total may look high, but only a fraction is actually usable (free). Unfortunately, new information suggests that the *free testosterone* measure may not give a complete picture. Plus it's more expensive, because it requires measuring both *total* and *free* (Corning charges $134 for *total* and $194 for the combination of *total* and *free*). I recommend measuring the *total* first, and only if the result is questionable (that is, in the normal range despite classic symptoms of low testosterone), go on to do a *free testosterone* test.

Sean's most recent testosterone measurements demonstrate the difficulty of interpreting these tests. The *total testosterone* is 1047 nanograms per decaliter, which is on the high end of the *expected*, or normal, range. The *free testosterone* level, at 123.9, is also well within the normal

range. The % f*ree testosterone*, which at 1.18 is within the *expected* range, shows what proportion of the *total testosterone* is represented by the *free testosterone*. If the number dips below *expected*, it might be another sign of deficiency.

Note that these *expected* ranges, based on an average of a given patient sample, are changed periodically as new research is done; each lab uses its own range. Furthermore, testosterone levels decline with age, so it would be more useful to compare your measure to a reference range of your age group, but few labs volunteer that information (Corning will provide it if your doctor requests it).

On the surface, Sean's results might seem surprising: He has only 24 CD4 cells, his weight is low-normal, and he reports that for more than two years, his libido has been low, particularly in the last few months, after starting new antiretroviral drugs. These are often warning signs for possible testosterone deficiency. But he has been on the anti-depressant drug Zoloft for several years, which, Sean says, "tends to kill my libido." Also, he reports that the chemotherapy he has been taking off and on since last November for his pulmonary Kaposi's sarcoma (KS) tends to depress his sex drive. So those two drugs could provide the explanation, but there may be other physical or psychological factors at work-or the test results might be wrong and he may want to repeat them at a different lab. I just don't know. Sean may want to discuss various options with his doctor.

In my experience, the exact laboratory value is less important in making treatment decisions than the total clinical picture. Besides all the factors already mentioned, there is the variability of the measure over time (levels vary during the course of the day as well as seasonally; morning tests are better, but it's not critical). Also, even a 50 percent drop in *total testosterone* from 800 to 400 ng/dL will still be within the *expected* range.

When should a PWA get a testosterone test? Only if there is some other indication of a problem that might be caused by low levels of this hormone. That includes the symptoms, mentioned earlier-low or no libido, impotence, low energy, loss of appetite or declining weight or lean body mass. The latter can be determined by a bioimpedance analysis (BIA), a cheap, noninvasive test which some doctors and hospitals can perform (see *POZ* No. 12, p. 92). This test is an important early-warning sign for possible wasting, and if one tests below normal, a testosterone test would be a good next step.

Testosterone replacement is appropriate for those symptomatic HIV positive men with levels in the botton quarter of *expected* (either *total* or *free*) or lower, along with either a very low BIA result and/or any of the above symptoms. Because of federal restrictions on prescribing testosterone and other anabolic (muscle-building) steroids-due to abuse by bodybuilders and others-some doctors are uncomfortable prescribing these drugs unless a test result shows level to be below *expected*. Our research has shown that testosterone therapy can resolve many of the common symptoms of deficiency (although impotence is less often treatable if sexual desire is intact). In almost all cases, libido is restored and many people report improvements in energy, appetite, weight, lean body mass and mood.

There are three ways to administer testosterone: Intramuscular injections (which are painful; cost is about $15/month); transdermal patches (Testoderm, $75/month, for the scrotum; Androderm, $125/month, requires two patches on the arm, shoulder, torso or thigh); and pills (only oxandrolone [Oxandrin], $750/month at 20 mg/day, is recommended; other pills are likely to damage the liver). In general, these treatments have few side effects. Each therapy has pluses and minuses, and patient preferences vary (as does access to medical coverage). Other anabolic steroids such as nandrolone (Deca Durabolin) may also be useful.

In August 1994, after Sean displayed the classic deficiency symptoms, and both of his testosterone levels were measured in the lower portion of the *expected* range, his doctor decided to begin testosterone injections. (Later calculations by another doctor found that when age-adjusted, Sean's levels had actually been below the normal range.) Within four months, he developed external KS. He continued injections off and on until November 1995, when the KS spread to his lungs. Sean then stopped the injections because he believe that they had exacerbated his KS. He is not alone. Some doctors and PWAs have expressed concern that testosterone therapy may worsen existing KS, and one doctors reports a case where he strongly suspects that this occurred. While there is theoretical evidence to suggest this, the clinical evidence is limited and inconsistent. I asked several dermatologists who are HIV specialists about this and none have been such an association. It might be prudent for those with established KS to be more conservative about initiating testosterone therapy.

Testosterone is not approved for use with women. Irreversible side effects include facial hair, clitoral enlargement and voice deepening. There are, however, other steroids such as oxandrolone and DHEA which are under study in both women and men.

Note that several drugs are known to deplete testosterone, including oral ketoconazole, spironolactone, cimetidine, as well as large amounts of marijuana, heroin or methadone, or chronic use of alcohol. Megestrol acetate (Megace) is also believed to do so, and ganciclovir may have this effect, although this is less certain. If you are taking one of these drugs and a substitute is not available, you are still likely to respond to testosterone therapy. If possible, it might make more sense to treat the underlying problem by stopping the drug (especially if it is recreational) than to treat the consequence.
