

## Sex Hormone Binding Globulin

How annoyed would you be if you were struggling to make ends meet, yet your bank account looked quite healthy? All that much needed cash was tied up in some ISA or saving scheme but was inaccessible. The bank was perfectly happy, but you had to just struggle on. Quite aggrieved, I expect. I would be. Bloody bankers...

Having an elevated level of SHBG (sex hormone binding globulin) can be very similar to dodgy bankers. It takes your hard earned testosterone, locks it away and only pays out a crappy 2% interest rate. This 2% is all you have available to spend at any time.

Around half (usually it's about 45%) of all testosterone is bound to SHBG. Slightly more is bound to albumin (a protein produced by the liver). This distribution is nearly equal, despite the fact there is so much more albumin than there is SHBG. Testosterone just very much prefers to be bound with SHBG which evens things out. This binding allows testosterone to be safely transported around the body and not get used up. Instead testosterone is gradually released in suitable amounts at the right time. Only about 2% at any time is 'free' to do its job.

Usually this is not a problem. However, it can be when total testosterone levels are within normal ranges and SHBG is high. A higher proportion of the total testosterone is 'bound' and inactive. It's sitting there but there's nothing you can do with it. Sometimes the body compensates for this by increasing total testosterone. Sometimes not.

So despite a normal total testosterone value, your free testosterone is significantly reduced. This can cause the same symptoms of hypogonadism (low testosterone) such as lack of libido, depression and fatigue. What's worse, a cursory look at only the total testosterone levels will overlook the hypogonadism completely! It does look normal after all. This can prevent a correct diagnosis and render the patient ineligible for testosterone replacement therapy. It is always important to include SHBG in any hormone profiling. We need to know if the levels are normal. But what if the levels of SHBG are high?

There may be a case for exploring the prescribing mesterolone (Pro-Viron) in this instance. This, of course, is solely at the discretion of the specialist. Pro-Viron is a synthetic male sex hormone. It's not very anabolic but does bind very strongly to SHBG. By doing so leaves even more testosterone effectively free or 'unbound'.

One cause of raised SHBG can be previous anabolic steroid use. Steroid use will lower SHBG whilst on cycle, but it will leap back up again. An impaired liver and raised oestrogen levels will also increase SHBG. Steroid use can result in this, too.

An oestrogen level test and liver function are required to rule out causes of elevated SHBG. Too many circulating thyroid hormones are also a contributing factor. The non-prescribed and unsupervised use of thyroid drugs must be avoided.

The best way to address the concern of high SHBG levels is naturally.

We know that liver damage can be a contributing factor. Avoid unnecessary medication or drug use which can be harmful to the liver. Not being overweight helps too. By overweight I mean fat. Sorry to go all PC on you there. The more fat there is being carried, the greater the conversion of testosterone to oestrogen. This results in a vicious cycle where testosterone continues to drop, fat deposits are increased and then so too is oestrogen.

A sensible training regimen that addresses both fat loss and muscle gains helps a lot. There are numerous references to supplementing the diet with fish oils that make a lot of sense.

Vitamin D levels that are within normal ranges will assist to lower SHBG. As vitamin D is partly synthesised by the body in response to sunlight, many in the UK are deficient. UK weather is shite. The other source of Vit D is from diet, mainly through animal products such as fish, eggs and meat. Supplementing with Vit D is recommended and should help. Blood levels of vitamin D should not fall below 25 nmol/L. New recommendations from the Scientific Advisory Committee on Nutrition (SACN) include an intake of 10 ug (micrograms) for *all* the population over 1 year old. It's clearly rather important stuff. And the suggestion is we're not getting enough. Body building doses are reported to be between 25-75 ug. A dose of 25ug is the same as 1000 IU, just to complicate things...

An adequate protein intake does have a positive impact on SHBG. Ensure a daily intake of around 2 grams per kilogram of body weight.

Other suggestions include stinging nettle and boron as supplements. I've yet to see satisfactory evidence so can't suggest these as helpful options.

Left alone SHBG will rise as we age. Employing the correct use of brief, intense and infrequent training, coupled with sensible nutrition should keep the wolf from the door. And those bloody banker's hands off your testosterone account.

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