

case study:

A personal evaluation via blood tests

Paul Ehren uses laboratory blood tests as part of his armoury – they form a first stage health screen for his strength athletes. In his article, he talks us through some blood analytes, using himself as the guinea pig.

As a competitive bodybuilder and coach/nutritionist over the last 15 years, I have carried out literally hundreds of blood tests on myself and clients as an integral part of my 'health first' approach. I have focussed on the philosophy that from optimum health we will achieve optimum performance and continued wellbeing and longevity.

The counter argument of addressing performance as the only issue of worth has been bought into very sharp focus recently with the death of a professional bodybuilder at the age of 26. The autopsy results are quite shocking for a number of reasons. To paraphrase the document, the cause of death was: "concentric left ventricular hypertrophy with coronary artery atherosclerosis" – linked to this, his heart, liver, kidneys and lungs were all approximately three times their normal size. Additionally, there was papillary thyroid

carcinoma, plus a history of dyslipidemia, elevated aminotransferases, chronic cough and shortness of breath, and a family history of early onset atherosclerosis and hypertension.

As an elite strength athlete, he would have been pushing the extreme boundaries of training, dietary and supplementary practices. The thing I find the most unsettling of all is that none of the conditions listed above just happened overnight; their onset would have been slow and should have been obvious from routine blood tests and medical screens.

Turning now to the routine blood testing that I carry out, experience has taught me many lessons, including:

- Each test has to be put into context based on the client and their individual circumstances.
- As with anything crossing the divide between conventional medicine and our own professions of nutrition/coaching, I

have always seen it as vitally important to be very aware of your own 'pay grade' as a professional: you will start to get into very deep waters diagnosing medical conditions that you are not absolutely certain about.

■ I have found that certain patterns emerge in the results, depending on the exact nature of the sport/activity being carried out by the client. For example; certain markers are often seen to be elevated/inhibited in strength athletes and these are often completely different to those seen in endurance athletes and other disciplines.

■ It is worth asking yourself: "why am I getting this test done and what am I going to do with the results?"

■ Lastly, there is a rubicon to cross between conventional medicine and functional nutrition/medicine. Since there is a degree of mistrust on both sides, the middle ground is no doubt the way forward, taking advantage of the excellent skill sets on either side.

“IT SHOULD ALSO BE REMEMBERED THAT... ELEVATED CHOLESTEROL CAN COME ABOUT FROM A NUMBER OF HORMONAL CAUSATIVE FACTORS, COMPLICATED BY THE POSSIBLE USE OF EXOGENOUS HORMONES.”



The tests

Looking now at specifics, my first stage protocol in diagnostic testing for myself or any bodybuilder or strength athlete would be a basic haematology and biochemistry blood test. I consider this to be a general internal ‘MOT’ and it would cover the following areas:

- Red blood cell health and status
- White blood cell health and status
- Systemic inflammation markers
- Kidney health
- Liver health
- Creatine kinase
- Lactate dehydrogenase
- Uric acid
- Blood glucose
- Lipid profile
- Iron status

This year, however, I wanted to expand the parameters of my own personal testing, so in addition to the above, I also ran the following:

- Anion gap
- HbA1C
- Insulin
- Enzymes – amylase and lipase
- Minerals – calcium, phosphorous and



- magnesium
- Thyroid – TSH, Free T3, Free T4, Total T3, Total T4
- Homocysteine
- Vitamins – D, B12, folate
- Hormones – testosterone, DHEA

When analysing the results, we need to be aware of the exact circumstances of the client. Apart from the obvious (age, gender, current and past health issues, nutrition status, lifestyle etc), we very much need to take account of the nature of their sports and all that that entails. The elephant in the room with regards strength athletes (among many others) is the use of Performance Enhancing Drugs (PEDs) – either you must make the decision not to work with individuals taking PEDs or you must have a completely open relationship with your client to be able to discuss the subject. You must also understand the nature of action of the substances used and their effect on the internal systems and their interaction with other medications/supplements/foods. Without this understanding, the results become worse than meaningless.

My own test was carried out on the 21st September 2017; I had competed in the NABBA British Bodybuilding finals a little over three months prior to this, with all that elite level competition requires. My diet had since reverted to my general off-season intake and I was back in heavy training, having taken a few weeks off after the competition. My supplementation protocol at this stage was very much health, as opposed

to, performance based.

Without going through each of the approximately 70 markers contained within my tests, I would like to pick out some of the highlights and comment on their possible impact.

Blood glucose regulation

Blood tests are normally carried out fasted in order to achieve a baseline blood glucose level. Additionally, haemoglobin A1c and insulin were measured. The glucose and insulin levels are a ‘here and now’ reading, which is influenced by consumption of foods prior to the test. HbA1c (glycated haemoglobin) gives a longer term picture by evaluating the glycation of red blood cells over approximately a three month period, which corresponds with the life of the average red blood cell.

I have rarely come across problems with athletes’ blood glucose control due their age and dietary discipline, although there is currently a phase in bodybuilding to ‘junk load’ after training sessions with processed foods that have high levels of refined sugar, such as Pop Tarts, Coco Pops, sodas and confectionary. This incredibly misguided approach may well lead to broken athletes and I am already picking up the pieces from a couple of guys who are experiencing real disease state problems, which I am convinced has been bought about, at least in part, by their excessive consumption of sugars and the methods used to drive these sugars into the muscle cells.

► Renal

This panel tends to consist of estimated Glomerular Filtration Rate (eGFR), which is a marker of basic kidney function, the nitrogenous wastes urea and creatinine, and electrolytes. This is an important part of the test because impaired kidney function can obviously lead to severe complications. PED use, poor blood pressure control, high protein diets and hydration issues can all cause problems here. The main issues I tend to see are fortunately not full blown renal dysfunction, but high urea and creatinine levels, which can easily result from high protein diets and excessive creatine supplementation, which can also slightly reduce the eGFR. I would tend to look at hydration as the first point of call, together with possible dietary modification and to monitor results in three months if a slight problem exists. Anything causing real concern would require medical intervention.

Metabolic

My set of results included the analytes uric acid, creatine kinase and anion gap.

High uric acid levels tends to come about as a result of over-consumption of purines and is usually used as a marker for the onset of gout. This has very rarely been an issue on the tests that I've completed with athletes. Anion gap is normally used as a marker of possible acidosis – again, this is not a marker that I have regularly seen out of range.

Creatine kinase (CK) is an interesting one as it cuts to the heart of the 'know your client' comments made previously. CK is an enzyme, whose activity is greatest in brain, heart and striated muscle tissue, although its elevated presence can also be markers for a number of hormonal disorders, or as a result of high levels of alcohol or certain drug use. My own high levels prompted a concerned phone call from the lab, who thought I might be in the process of severe cardiac issues, until I pointed out to them that I had just completed a week's heavy training, including squat and deadlifting sessions. The resulting tissue breakdown is normally the reason for high CK levels in strength athletes, although full analysis of the results may also point you towards an athlete who is either in or entering a catabolic/over-trained state.

Liver and gallbladder

Now we start to become very relevant to strength athletes. I mentioned earlier, as part of the autopsy results, that the young man had elevated aminotranferases. This is very common among bodybuilders and power lifters, particularly when the use of exogenous steroids are involved. The two main enzymes seen in the above panel are alanine aminotransferase (ALT) and aspartate aminotransferase (AST). AST's can also be

elevated as a result of exercise-induced muscle damage and are therefore seen as a less reliable test for pure liver stress than ALT's. Many elite strength athletes will show signs of mild liver stress, including myself, and it really becomes a call by the practitioner as to whether this becomes worthy of further investigation. With myself, having carried out additional DNA testing, I am aware that I have a deletion on one of the main detoxification genes, GSTM1, and therefore I address my detox and methylation supplementation in some depth. Bilirubin and lactate dehydrogenase are two other elements that are often tested and worthy of attention if out of range in this panel.

Lipid profile

Normally included here will be triglycerides and cholesterol. Depending upon dietary adherence, various elements here can be out of whack with strength athletes. Steroid use does have a marked effect on inhibiting HDL cholesterol and on increasing LDLs. It should also be remembered that we are using a functional model for these athletes and elevated cholesterol can come about from a number of hormonal causative factors, complicated by the possible use of exogenous hormones.

Thyroid

This was of particular interest to me, because in my nearly 20 year bodybuilding career, I had never had my thyroid investigated and even though, to the best of my knowledge, I have been completely asymptomatic, I have followed some extreme dietary and supplement practices. Fortunately, all markers were within range, but please be aware that it is common for athletes to use exogenous T3 or T4 medication, and you may possibly come across dysfunction caused by suppression of the body's own natural production. Although fortunately extremely rare, refer back to the autopsy comments and note that our athlete had early stage thyroid carcinoma.

Inflammation/oxidation

Markers in this panel include C-reactive protein (CRP) and erythrocyte sedimentation rate (ESR), both of which are flags for systemic inflammation issues. We also have homocysteine, raised levels of which seem to correspond to cardiovascular dysfunction. Fortunately, once again my own results were all comfortably within range.

Vitamins

The real point of interest here was that my own vitamin D levels were within standard range, but less than optimum. Last winter was the first time that I had supplemented vitamin D and I believe that there was a

noticeable difference in my health and training performance. I will continue this practice this year.

Hormones

This was not a full comprehensive hormonal screen: it covered only total testosterone and DHEA, but even without seeing the results, I knew what they were likely to show. This again is a perfect example of knowing your client and the relevance of tests. Any athlete/client involved in exogenous hormonal manipulation will be showing some pretty screwy results, which without knowing the context, will set all forms of alarm bells ringing.

Haematology

Haematology is basically a general run through the status and health of red and white blood cells. Raised or inhibited white cells can be a marker for a number of disease or injury states. Mine, thankfully, were all within range.

Red blood cells are an area where we often see results outside the 'normal' range when dealing with strength athletes. My own results were very typical, with elevated haemoglobin and haematocrit (the ratio of the volume of red blood cells to the total volume of blood) levels. Training, diet and supplement practices can all influence these levels due to their effect on haemopoiesis (the production of red blood cells), and these factors can also affect systemic iron levels. Like all these measurements, the exact levels are more important than the fact that the results may be outside of 'normal' range.

When dealing with athletes in general, and strength athletes in particular, we must at all times bear in mind that we are not dealing with the average population and any blood result will reflect this. Proper, informed interpretation of the results and their interrelation is therefore vital. **fsn**



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