Healthy Organ, Nice BUN

Sean Strub scores well on his liver and kidney function tests

April 1, 1997 By Ross Slotten, MD, MPH

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. Ross Slotten, MD, MPH, is a Chicago physician who has treated thousands of PWAs during the past 13 years. He analyzes the liver and kidney values of POZ founder Sean O. Strub.

Sean is, by his own account, “quite a depository for pharmaceuticals.” On any given day, he may take 12 or more medications. His situation is not unique; the more advanced someone with HIV is, the more medications he or she is likely to be taking. Although these may be life-extending, they have potential side effects and interactions. In particular, many HIV-related drugs (either singly or in combination) can inflame the liver, and a lesser number can harm the kidneys. Five of Sean’s current drugs are known to sometimes adversely affect the liver: TMP/SMX (Bactrim or Septra), clarithromycin (Biaxin), itraconazole (Sporanox), fluconazole (Diflucan) and indinavir (Crixivan). Luckily, we have tools to identify a problem before overt symptoms develop. Among those tools are liver and kidney function tests.

The simplest screens of liver and kidney function are included among many other lab measurements on the routinely taken chem-screen panel (although on Sean’s report, the lab has grouped readings that are outside the established reference range -- that is, abnormal -- in a separate section for “at-a-glance” simplicity). The major liver function tests are the alk phosphatase, g-glutamyl transpep., ast (sgot), alt (sgpt) and bilirubin (total and direct), each of which measures enzymes excreted in abnormal amounts when the liver is inflamed. ld (sometimes called ldh) and albumin can also reflect the health of the liver, but may be abnormal in other disease states (such as heart, lung or kidney disease) and are thus considered to be less specific measures. The two major tests of kidney function are bun (blood urea nitrogen) and creatinine, both of which measure waste products that build up unduly in the blood when the kidney is malfunctioning.

Most of Sean’s results are within the reference range. All of Sean’s liver function tests are normal except for bilirubin (see below). In general, we get concerned about abnormal lab values when they are new or dramatically changed, not easily explained or correlated with other symptoms -- or when there are no prior comparison values. Elevations of liver enzymes can indicate an inflamed liver, which may lead to symptoms of hepatitis: Nausea, vomiting, pain above the liver, fever and jaundice (yellow hue in skin and eyes). When a person’s enzymes rise five or more times

above the upper limit of normal, we get worried because a chemical hepatitis is likely to develop. If a medication is a known cause of such abnormalities, it should be stopped.

However, before rushing to stop a medication, other things need to be considered; the patient's history becomes very important. For example: How much alcohol has the person been drinking, present or past? Has the person been sexually active? It's possible the person could have acquired a case of viral hepatitis, for which there are specific blood tests. When the liver is severely irritated, all potential culprits must be stopped. If the tests do not return to normal within a few weeks, and we've ruled out viral hepatitis, the patient's doctor may suggest more sophisticated tests, such as a CAT scan or liver biopsy. The idea is to identify a cause and, hopefully, treat it.

Sean's bilirubin values are slightly above the reference range (his total bilirubin is 1.87; direct bilirubin, a subunit of the total, is 0.23). Bilirubin is a chemical byproduct of the breakdown of red blood cells. The liver acts as a filter and processes this bilirubin. If the liver is irritated, the filter gets plugged and everything behind backs up. Once total bilirubin rises above 2.5 or so, this chemical may get transported throughout the body and a person's eyes will become yellow; higher than this, the skin may become jaundiced, with urine as dark as tea.

Since Sean's bilirubin value is newly elevated (five months earlier, it was normal), the most likely cause is his starting on Crixivan in the interim. Crixivan is known to cause an isolated elevation of the bilirubin (meaning it is the only liver function test to change) in 10 percent of individuals taking the drug. In this situation, no harm is caused, so Sean need not change any of his medications.

Currently, Sean's kidney function is normal: He has a nice bun and his creatinine level is OK. If his bun were very low (eight or less), it could reflect malnourishment (the kidneys would then have much less work to do), but not necessarily any kidney problem. If one of the drugs were irritating his kidneys or he were dehydrated or his prostate were enlarged and obstructing urine flow from his bladder, his bun and creatinine might rise to high levels. If the underlying problem were not corrected, the bun might rise to near 100, the creatinine close to 10, and he might develop total kidney failure and require dialysis.

Kidney stones develop in some people taking Crixivan (the manufacturer claims 4 percent; others believe more), but they do not reflect kidney disease. No one knows precisely why they occur. A stone traveling painfully down the urinary tube will cause blood in the urine -- but no change in the bun and creatinine. Unfortunately, no lab tests can provide warning signs to predict the development of stones. One essential -- but not 100 percent protective -- precaution for Crixivan-takers is to drink at least 48 ounces of water daily.

Of course, Sean is in an ideal situation: His drugs not only work, but also have caused him few side effects. There's no sense taking medications if they destroy your quality of life. But be aware that for liver and other side effects, tests like liver values usually give you a chance to stop the drug before permanent damage is done. With close monitoring, most people can take these drugs and benefit. Sean is an excellent example.

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