Homocysteine, cART, PrEP and HIV: What To Know

Nine out of twelve HIV+'s on ART found to have elevated levels, in one well-conducted study

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Although less well-known than routine labs for, say, blood glucose or liver enzymes, knowing your homocysteine level can provide valuable insights into your overall health. Elevated levels— generally regarded as anything above 11 (micromol/L), although 7 and below is argued by many to be a superior threshold— have been associated with various and not insignificant health risks.*

What is Homocysteine?

Homocysteine is a byproduct of the metabolism of another amino acid, methionine, which we consume through our diet. Methionine is essential for many bodily functions, but if it is metabolized incorrectly, it can lead to elevated homocysteine levels.

The metabolism, or break-down, of homocysteine depends on the availability of the B vitamins, 9 (folate), 12, 6— and to a lesser extent B2 (riboflavin). For this reason, elevated homocysteine levels are a kind of indirect marker of B vitamin deficiencies. And we all know (or should know) by now the supreme importance of the B vitamins!

High levels of homocysteine and low levels of B12 and folate become increasingly common as we age, and correlate with common health conditions seen in aging populations such as cardiovascular, cerebrovascular and neurocognitive illnesses. Elevated levels of homocysteine in an aging (but HIV-negative) cohort in one study were associated with brain atrophy and increased incidence of white matter lesions over time while in a second study, higher levels of B12 and lower homocysteine levels were associated with a decreased rate of brain volume loss.

Why Should You Care?

In addition to these two studies on homocysteine, B vitamin sufficiency and brain volume loss, research indicates that high levels of homocysteine are linked to other key health issues, such as:

1. **Cardiovascular Disease**: Elevated homocysteine levels are considered a risk factor for coronary artery disease, stroke, and peripheral vascular disease. (refs)
2. **Bone Fracture Risk**: Some studies suggest that high homocysteine levels may be linked to a higher risk of bone fractures in elderly people. (refs)

3. **Cognitive Function**: Although not conclusive, research has shown a correlation between high homocysteine levels and impaired cognitive function, including Alzheimer's disease. (And keeping homocysteine at 7 or below is a feature of the Dale Bredesen dementia reversal program.) In this Italian study, published in BMC Infectious Diseases in 2019, I really like, the cognitive effects of elevated homocysteine/inadequate B12/B6 were reported to be ""worsening speed of executive function" and "less fluent language." So just keep that in the back of your mind as something to "rule out" for you or anyone you care for who might be experiencing such issues. (refs)
4. **Mental Health**: Elevated levels of homocysteine have also been associated with depression and other mood disorders. (refs)

Who (& How) To Test?

Given the health risks associated with elevated homocysteine levels, certain groups should consider getting tested:

- People with a family history of cardiovascular disease
- Individuals over the age of 40
- Those with a history of unexplained blood clots
- Individuals suffering from chronic conditions like diabetes or high blood pressure

And the following papers would argue for routine testing in:

- Anyone on ART (or daily PrEP, for that matter)
- Especially anyone on a protease inhibitor-containing regimen (Do people still take protease inhibitors?) or otherwise concerned about lipodystrophy
- Anyone worried about the potential cardiovascular side effects of ART (or other medications they're taking), especially many of the integrase inhibitors

If you have a HCP who happily works alongside you, maybe ask that this be added to your next blood draw. Alternatively, just about anyone living outside the states of New York and New Jersey can order (but also pay for) his or her own blood test on sites like DirectLabs, MyMedLab, even LifeExtension and others. OwnYourLabs is Dr. Robert Lufkin's ("Lies I Taught In Medical School") current fave.

Finally, there are now also finger prick blood tests (SiPhox Health is one of the latest, available, it appears, at least for now, even in NYS, and the list of companies offering these sorts of at-home DIY health monitoring seems to grow each week) that measure homocysteine along with another dozen or so much under-valued (imo) makers not routinely measured by the average HCP, such as (fasting) insulin, first morning cortisol, vitamin D, ApoA1, ApoB, as well as the principal sex and adrenal hormones. Just know that the reference ranges for "capillary blood," what you squeeze out of your pricked finger onto an immunoabsorbent card, are not always the same as the reference ranges for venous blood, but the methodology itself has been validated for the bio-markers

offered.

How Can You Lower Homocysteine Levels?

1. **Diet**: Eat a balanced diet rich in folic acid and other B vitamins: vegetables, fruits, and– if you're not in the "no grains" Paleo and other camp– whole grains. (I am still kind of on the fence with this issue. The best answer seems to be that it is highly individual.) The B vitamins, especially B6, B12, and B2 (riboflavin) help to lower an elevated homocysteine, as does the betaine in foods like red beets and its quick-change doppelganger choline, found most plentifully in the yolk of eggs. (refs)

1. **Supplements**: Consider B-vitamin supplements after consulting your healthcare provider. Just about every professional supplement brand has a product these days targeted at managing/lowering elevated homocysteine levels. Most of the really cracker jack practitioners I know all say the same thing: they rarely if ever supplement B vitamins in isolation; because, they insist, the B vitamins work as a team. So rather than focus on only, for example, 12 and 9, you might want to also consider a formulation that offers reliably bio-available (and preferably methylated, in the case of 9 and 12) non-contaminated, in reasonable amounts, of all the B's: from 1 to 12 and including the lesser known or sometimes called "pseudo-B's" like choline/betaine and inositol (often called B8). But try food first!!

Regular exercise, quitting smoking, and reducing alcohol intake can also contribute to lowering homocysteine levels.

--> See also this Poz entry on homocysteine and CV risk— from 2010!

* Some of the studies on homocysteine levels use 18 (micromol/L) as the cutoff for what is considered "normal," but most MDs and naturopaths in my world would consider that a very, very high upper limit of normal. Have a look at the literature and reputable health/health guru sites, and decide for yourself. And/or talk to your MD, PA or NP to get her/his take as well. If you can't get to under 7 (the Dale Bredesen brain health upper limit), at least aim for 10 or lower (the functional medicine/preventative medicine upper limit).

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