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Follow up info

Thu, May 11, 2023 at 10:17 AM

Below are the notes from our meeting:

-No MTHFR/ Het COMT: 2x slower dopamine/adrenaline breakdown (prone to anxiety/overstimulation)…**Pure Genomics Multi Vitamin**…you want adenosyl & hydroxyl B12

Avoid COMT inhibitors: Quercetin, Rutin, EGCG (green tea)..Not that they're bad for you, but because they can be in supplement stacks and may cause anxiety without you knowing!

-increased need for vitamin A, vitamin E, vitamin K, manganese, iodine, B12 (all in multi)

-**Magnesium L threonate** to speed up COMT (by far the best for brain/anxiety!)…you also had an increased need!

-Hom Slow MAO: Slower breakdown catecholamines (dopamine and adrenaline) AND serotonin, so very similar to slow COMT…Be weary of MAOi's such as Piperine, Turmeric (Curcumin), Rhodiola Rosea (Golden Root), Kava, Resveratrol, Berberine, Fenugreek, Cinnamon Bark extract, Astralagus, Rosemary, and Olive leaf.

-1x Hom & 1x Het MTRR/1x Het MTR: Likely reduced activation of MTR enzyme (recycles B12)…**Lithium orortate** can help those with MTR/MTRR mutations. Can help a lot with anxiety/depression/aggression/energy. In part by helping to aid neurogenesis. It also helps transport B12 into cells and lowers adrenaline. Also has very good data at preventing cognitive decline with age. You want to take this for 1-2 months then take a few weeks off. Needs to be cycled.

-1x Hom (less than 1% of population has this) & Het DRD2: Lower DRD2 (Dopamine 2 receptor) expression in brain regions responsible for motivation and reward…increased risk taking. Anxiety/Depression…**SamE** works well to elevate dopamine levels and **Lithium** may increase sensitivity (makes the fewer D2 receptors you have work better). This is a very different type than the high dose lithium bicarbonate used for depression. 5-20mg is usual dose for and I suggest 5mg to start.

-3x Hom BHMT: Used to lower homocysteine. So lower activity means higher homocysteine which is bad. Those with BHMT-08 (which you have) usually do better with **betaine HCl/TMG** for promote activity (digestion) and lower homocysteine. It also helps optimize nutrients absorption in the gut (including iron)

-3x Het AHCY: This enzyme is that turns SAH into homocysteine, which is used to make SamE, so lowered homocysteine and SamE deficiency is likely…Possibly high ammonia...has this been seen in blood work? Could manifest as high BUN. High ammonia symptoms include confusion, excessive fatigue/sleepiness, mood shifts, irritability, hand tremors, urine/sweat smelling weird (like ammonia)….**L-ornithine**

-Het CBS: Possibly faster activity, meaning increased homocysteine breakdown into taurine, ammonia, and sulfur instead of being broken down into cystathionine and BH4 (which are used to make glutathione). This means sulfur and ammonia sensitivity is likely (sensitive to sulfur onions and garlic).

-BUN (blood, urea, nitrogen) over ~17 (due to excess ammonia)…does urine ever smell weird? Likely after eating meat? High ammonia symptoms include confusion, excessive fatigue/sleepiness, mood shifts, irritability, hand tremors….**L-ornithine.**
-High taurine levels
-High sulfate levels
-Low homocysteine levels (less than 6)
-High copper

*Overactive CBS mutations may do well with **SamE*** --> helps raise homocysteine

-Het SHMT1: Lower conversion of THF into MeTHF (which is what MTHFR uses). B6 is a cofactor for this, which is in multi alongside direct MeTHF. So multi completely takes care of this!

-Het HNMT: POOR histamine metabolism in all cells…low histamine diet and food sensitivity testing. Minor food sensitives will be more intense with this mutation so need to pay special attention to diet…**SamE** is a cofactor…get food/environmental ALLERGY (skin prick) testing (report said more prone allergies)…**biomebreakthrough** is amazing at clearing out bad gut bacteria and adding strains that help degrade histamine…one of my fav products! Coffee, tomatoes, vinegar (ACV/pickles), and fermented things like kombucha, kimchi, and sauerkraut are very high in histamine, so avoid.

-Het AOC1: Reduced DAO expression…Poor histamine metabolism (particularly in gut), linked to migraines due to high histamine--> **Vit C (in multi)/copper/DAO enzymes** will directly help this (vinegar/coffee/tomatoes are high in histamine too!)…food intolerances app…food allergy testing (more prone to food allergies via report), try to go to an rheumatologist/immunologist/allergist for SKIN PRICK test

-**Histidine**: No mutation for higher need but given symptoms I think he could benefit. Yes it's used to make histamine but when you're constantly dumping histamine from triggers there won't be enough to make more, which can send the sell into shock and stress. Exposure to metals like iron, copper, or mercury stimulates metallothionein synthesis to bind and remove metals from body. Metallothionein can only be made when there is enough histamine. It's also used to make hemoglobin so deficiency will reduce oxygen transport leading to fatigue. Been proven to resolve eczema in young children and adults.

-Hom DHCR7/2x Hom GC/Hom CYP2R1/1x Hom & 4x Het VDR/Het CYP24A1: Reduced Vitamin D synthesis from sunlight, transport through blood to cells, processing (to 25D), cellular sensitivity, and increased active D3 breakdown…**D3/K2** supplementation. I would like to see 80-100 ng/ml to compensate for VDR for a few months to see how things improve. Also want to make sure you're getting in some good **Magnesium and Boron**. Based on CYP2R1 mutation I think that **d.velop** a new type vitamin D (25D) on the market. Low vitamin D is linked to many of your symptoms

Cholecalciferol (D3) ------CYP2R1----------> Calcifediol (25D) ------CYP27B1------> calcitriol (1,25D) [degraded via CYP24A1]

-Het FAAH/Het DAGLB: increased breakdown of endocannabinoids, which are your body's own version of THC= chronically lower endocannabinoid levels. Linked to inflammation, sleep, stress, mood, and gut issues…**CBD** specifically blocks this enzyme, boosting endocannabinoid levels.

-Increased need for **copper**: Helps make adrenaline (energy) as well as breakdown histamine. **Beef liver capsules** are a good food source and he can start them dose low. Be weary of sneaky iron chelating supplements, like flavonoids…some common ones include curcumin (turmeric), rutin, quercetin, epigallocatechin (EGCG/green tea extract), myricetin, apigenin, and luteolin.

-Increased need for **glycine** which is important for antioxidant production/detox but also helps calm and promote good sleep. Also helps with collagen synthesis and good data on depression/anxiety (supplement form). Bone broth is a good source, but is also high in histamine, so may not be good for you. The skin of meat, ribs, and drumsticks are good meat sources of glycine.

1x Hom & 1x Het NOS3: reduced nitric oxide production which is important for immune cell health/ammonia detoxification/blood clotting/histamine/glutathione production…it decreases as we age, so supplementing as you age is super important…do fingers/toes get cold? High blood pressure? Erectile dysfunction? **Agmatine sulfate** is my fav booster (also has good mood boosting/anti-anxiety data). Saunas (especially infrared) and sunlight also boost this! Avoid anti-bacterial mouth wash (kills microbiome that makes nitric oxide).

3x Hom & 1x Het PEMT: Reduced production of **phosphatidylcholine** in the liver. Supplementing with it has been shown to improve concentration and memory. Choline deficiencies also linked to poor liver health (non-alcoholic fatty liver disease), as well as cognitive decline with age. Beef liver, chicken liver, whole eggs, cod, salmon, and chicken (from best to worst order) are great food sources of PC.

-Het TPH2: Reduced 5-HTP synthesis=reduced serotonin and melatonin synthesis…**5-HTP** can directly help with this. So **tryptophan** supplementation may not work as well. But I think starting with it makes more sense since it's

more natural.

-Het HT1A: reduced sensitivity of the serotonin 1A receptor… This means the serotonin your brain releases does not activate this specific receptor as much as it should, leading to mood issues. **CBD** specifically binds and stimulates this receptor. CBDa is even more potent of a binder…I'm not sure if you can find a good source of this by you.

-2x Het HT2A: Mutation in the serotonin receptor that psychedelics (LSD/mushrooms/DMT) bind to and activate. Studies haven't shown if it increases or decreases serotonin binding capacity, but I would hypothesize it decreases binding. Therefore, **microdosing** may be a good targeted treatment. There is also a new modified form of bacopa herb concentrated with a specific molecule that can increase sensitivity of these receptors. Another alternative if you want to dabble with this receptor but not try any psychs is Cognance from nootropics depot. Use this link then search cognance--> https://lddy.no/1en0h

-Hom OXTR: Reduced sensitivity to calming effects of oxytocin, the love/cuddle neurotransmitter. Magnesium helps sensitize receptors and taurine can help with release…**iCalm…**

-Hom GRM8: Associated with increased glutamate production, which is linked to anxiety/neuroticism/hurt feelings/OCD, this also makes you sensitive to excess free glutamate (like MSG on processed foods or even some collagen supplements)…**L-theanine and taurine works in part by lowering glutamate (iCalm!)**

-Het SERPINA1: Higher cortisol levels, linked to stress/anxiety/poor sleep…**CBD/iCalm**

-Het PER2/Hom CLOCK: disrupted circadian rhythm, meaning cells have harder time telling when its day/night time, so lower melatonin secretion at night…Make sure to get sunlight in eyes in morning/early evening… **sublingual melatonin.** Melatonin gets a bad wrap, amazing anti-aging benefits. It tells the body to make more glutathione. The body makes 0.3-0.5mg per night. Dosing low each night is a huge anti-aging hack, even anti-cancer effects!

-Het MTNR1A/Hom MTNR1B: Lower number of melatonin receptors on cell surface, making the eyes/brain less sensitive to melatonin. Associated with insomnia, especially with caffeine consumption and insulin secretion. Limit light exposure at night **(eye covers/blueblockers/black out curtains)....sublingual melatonin**

-Higher parathyroid (PTH) levels: Higher levels increase blood calcium levels. But PTH can also be high from vitamin D deficiency.