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The MTHFR Gene Mutation

The Role of MTHFR

MTHFR is short for methylenetetrahydrofolate reductase, which is an important enzyme in our bodies. This enzyme plays a key role in converting homocysteine into methionine, both of which are amino acids (the building blocks of proteins). MTHFR is also required for methylation to occur. Methylation is a metabolic process that is critical to our bodily functions including turning our genes on and off, repairing our DNA, and converting folate and folic acid (vitamin B9) to its active, usable form (5-Methylfolate). This active form allows our bodies cells to divide and create genetic material.

Symptoms of an MTHFR Gene Mutation

Approximately 30-50% of the population carry a mutation in the MTHFR gene, which is passed down from either one or both parents.[1] If the mutation is severe enough, it may result in deficient folate levels within the body. If sufficient amounts of dietary folate are not converted to their active form, a person may experience deficiencies in their B-vitamins along with poor health outcomes. Poor health outcomes include:

- Increased risk of cardiovascular disease (e.g. heart disease or a stroke)
- Miscarriages and birth defects
- Mental health issues such as anxiety or depression with poor response to antidepressant therapy
- Increased risk of cancers including breast cancer, non-Hodgkin's lymphoma, and oral cancer
- Macrocytic anemia, fatigue, irritability, restless leg syndrome, diarrhea, weight loss and insomnia

Testing Options

If you suspect you have a MTHFR gene mutation, you may consider genetic testing. Genetic testing is now available through a simple and inexpensive blood test which can detect if the genes affecting the MTHFR have a mutation or are of the “normal” variation. These mutations are not uncommon, in fact in the US, approximately 25% of people who identify as Hispanic and 10-15% of people who identify as Caucasian have two mutations in the C677T gene.[3]

Foods to Avoid:

- Alcohol, especially after eating folate rich foods as alcohol can reduce folate absorption.
- Processed foods that have synthetic folic acid added to them, as the body is unable to process it and resultantly stores the synthetic folate as toxins in the organs and tissues.

Foods to Opt for:

- **FOLATE** rich foods: Aim to consume a high amount of dietary folate found in whole foods such as lentils, pinto beans, garbanzo beans, black beans, spinach, asparagus, romaine lettuce and broccoli.
- **B2** rich foods: Since MTHFR can impair how your body metabolizes vitamin B2, opting for foods rich in B2 allows your body to easily absorb the nutrients it needs. Foods rich in B2 include spinach, soybeans, almonds, lamb, oily fish, yoghurt, mushrooms, beet greens, asparagus, and eggs.
- **B6** rich foods: Vitamin B6 encounters the same issues that vitamin B2 absorption does in patients with MTHFR. To ensure optimum metabolism of B6, include foods such as oily fish, tuna, turkey, beef, chicken, sweet potatoes, sunflower seeds, spinach, and bananas in your diet.

- **B12** rich foods: As vitamin B12 is crucial to utilize folate, aim to consume sources from foods such as beef, chicken, eggs, fish, lamb, turkey, shrimp, ham, cheese (e.g. feta, mozzarella) and yoghurt.
- **Calcium** rich foods: Aim to consume adequate amounts of calcium through whole food sources such as tofu, sardines, and sesame seeds, particularly if you are consuming oxalate rich foods such as spinach, almonds and beets. This is important because when oxalate levels are high, sulfate levels drop which can place extra stress on the methylation cycle, potentially resulting in issues such as high homocysteine levels and inflammation.[4] As calcium binds to oxalate in the intestines, calcium helps to reduce the amount of oxalate being absorbed by your body.[5]
- **Betaine & Choline** rich foods: Important for the methylation process and to lower homocysteine levels, these foods include amaranth, beef, beets, broccoli, Brussels sprouts, eggs, cauliflower, quinoa, sardines, sunflower seeds, sweet potato, Swiss chard, turkey and liver.

Supplementation

If you do not efficiently metabolize folate, you may benefit from supplementing with methylfolate and a B-vitamin, however your specific gene type will influence which B-vitamin is right for you. Prior to supplementing, to meet your personal requirements, please consult with your nutritionist.

Diets to Consider for MTHFR

You may find it helpful to follow one of the following therapeutic diets which can be modified to your specific needs. These diets emphasize whole foods and do not advocate processed foods that have synthetic folic acid added to them. They also incorporate many of the foods recommended above.

Mediterranean Diet: This diet emphasizes a high consumption of vegetables, healthy fats, and moderate amounts of protein. It may also help to lower homocysteine levels, thus reducing the risk of cardiovascular disease.

Whole Foods Diet: This diet focuses on consuming whole foods including vegetables, fruits, whole grains, legumes, nuts, seeds, organic free range meat, and sustainably caught seafood. It is a great choice if you are experiencing symptoms of MTHFR due to the abundance of nutrient dense foods recommended.

Anti-Inflammatory Diet: This high fiber diet helps to combat inflammation by incorporating anti-inflammatory phytonutrients that can be found in fruits, vegetables and whole foods. This diet may help manage elevated homocysteine levels, which have been associated with inflammation.

References

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