



2024 INTERVIEW SUMMARY SHEET

SPEAKER**Elena Gross, PhD****TITLE & ORGANIZATION****Neuroscientist
Brain Ritual****TOPIC**

Is Migraine a Brain Energy Problem?

KEY TAKEAWAYS

- Migraine as a metabolic disorder is currently only a hypothesis. More research is needed to better understand the condition and its relationship to metabolism.
- Metabolism is the process of converting food into energy.
- Metabolic disorders can involve problems with digesting food or producing energy in the cells.
- Migraine could be a warning signal that there is an energy deficit, or mitochondrial dysfunction in the brain. In migraine, the brain is hyper-excitabile and so has a high energy demand.
- Ketone bodies, produced during ketosis, have anti-inflammatory properties and can reduce the excitability of the brain.
- Producing energy in the cells naturally leads to some oxidative stress. Antioxidant enzymes neutralize stress molecules (free radicals). It is thought that in the migraine brain, antioxidants are less plentiful and unable to neutralize all the free radicals. This depletes the ability of the brain to produce energy and leads to a vicious cycle of low brain energy and more oxidative stress.
- Migraine triggers such as perfumes, bright lights, loud noises, altitude, alcohol, and exercise all share a common link of increasing oxidative stress.
- Processed foods can increase oxidative stress, so it is important to eat a whole foods diet with minimal processed foods.
- Air pollution can increase oxidative stress, so using an air purifier may be beneficial.

TREATMENTS CITED

Air purifier	Multivitamins and
Coenzyme Q10 (CoQ10)	antioxidants
Blue light exposure reduction	Omega-3 fatty acids
Diet	Psychotherapy
Exogenous ketones	Sleep
Ketogenic diet	Stress reduction
	Toxin-free water

QUOTES

"Migraine is a very complex multigenic disease, but malfunctioning metabolism in migraine is a common link."

"The ketogenic diet can increase the production of ketone bodies, which have anti-inflammatory properties and can reduce the excitability of the brain."

"And all of these mechanisms together, because there are so many potentially migraine-protective mechanisms of ketones — ketone bodies ... It means that ketone bodies have [so] many pathways they can influence, that it may be a good tool for quite a lot of migraine patients."

"The No. 1 thing — always, no matter what — listen to your body. You have a very sensitive body that is sending you warning signals via the migraine, but also the fatigue. Your body knows best."

PRACTICAL STEPS

- Be cautious about the source and quality of nutritional supplements.
- Avoid drastic weight loss measures like fasting or strict ketogenic diets without medical supervision.
- Be thoughtful about the products you use and the food you eat by being aware of the ingredients in cosmetics and food and adjusting your consumption accordingly.
- Reduce environmental contaminants by improving your air and water quality by adding air and water purifiers to your home.
- Consult with your healthcare provider about whether you might benefit from a ketogenic diet or ketone supplements.
- Emphasize lifestyle changes to reduce psychological stress, such as saying no to unnecessary commitments, seeking therapy if needed, and prioritizing sleep.