diagnosis:Diet

Scientific and Clinical Rationale for the Use of Ketogenic Diets in Psychiatric Disorders

Thank you for the opportunity to share information about the use of ketogenic diets in the treatment of mental illness. Skepticism about this approach is understandable given the absence of randomized controlled clinical trials in this field to date, however the scientific arguments for applying ketogenic therapies to psychiatric conditions are strong. This 2020 review paper authored by researchers at Stanford, Oxford, and Harvard Universities offers more detail and perspective: "Ketogenic diet as a metabolic treatment for mental illness."

While we await more rigorous clinical trial evidence, a small but growing number of psychiatric practitioners around the world, including myself, have found the ketogenic diet to be a welcome addition to conventional care, particularly for the many patients who do not fully respond to medication, do not tolerate medication, suffer metabolic side effects of medication, or hope to reduce medication burden.

The 2022 open access paper "The Ketogenic Diet for Refractory Mental Illness: A Retrospective Analysis of 31 Inpatients," which I co-authored with Dr. Albert Danan, Dr. Eric Westman, and Dr. Laura Saslow, documents unprecedented psychiatric and metabolic improvements among patients with serious, persistent mood and psychotic disorders who were prescribed a ketogenic diet in a semi-controlled inpatient hospital setting. We found that this straightforward dietary intervention was medically and psychiatrically safe, well tolerated, and feasible to administer. Of the 28/31 patients who were able to follow the diet, 96% lost weight, 64% were discharged on less medication, and 43% achieved clinical remission.

As with any intervention, the ketogenic diet does not help everyone, but the majority of the hundreds of patients I have worked with, regardless of psychiatric diagnosis, experience at least some degree of improvement in their mental and physical health, typically within three to six weeks. Some are able to reduce or even eliminate their use of psychiatric medications, and for those who continue medications, the well-established metabolic benefits afforded by the ketogenic diet (including reduction in blood glucose and triglycerides as well as improved appetite control and fat loss) greatly help to offset the metabolic side effects of those medications.

While there are important contraindications, it is well established that the ketogenic diet is safe for most adults, provided it is healthfully constructed,

that the practitioner has enough information and experience to properly supervise the intervention, and that medications are thoughtfully and skillfully managed, particularly during the first six to twelve weeks when keto-adaptation is taking place.

A brief summary of the rationale for using ketogenic diets in psychiatry is below, followed by a list of the clinical trials already under way in the field.

Scientific Rationale:

- Ketogenic diets have been used to manage intractable epilepsy for 100 years, demonstrating that ketogenic diets stabilize neuronal networks; more than a dozen RCTs have been conducted in this field and reviews of the science are attached.
- Given significant overlapping pathophysiology between epilepsy and bipolar disorder, it has long been hypothesized that ketogenic diets may have mood stabilizing properties. The ketogenic diet also addresses many other common underlying features of neuropsychiatric conditions, including chronic inflammation and oxidative stress, neurotransmitter imbalances, mitochondrial dysfunction, and BDNF deficits/impaired neuroplasticity.
- Lifestyle-induced, chronic hyperinsulinemia (which now affects a growing majority of us) can lead to insulin resistance at the blood-brain barrier, restricting the brain's access to insulin. As optimal glucose processing within the brain requires insulin, insulin resistance impairs the brain's ability to utilize glucose. The resulting cerebral glucose hypometabolism is now understood to be an important driving force behind many cases of late-onset Alzheimer's disease. Abnormal glucose processing has also been detected in major depression, bipolar illness, schizophrenia, and other psychiatric conditions. Ketogenic diets have been shown to improve brain metabolic function by providing the brain with ketones—an adjunctive fuel source which crosses the blood-brain barrier easily and burns efficiently in a low-insulin environment, thereby helping to bridge the energy gap created by longstanding insulin resistance.

Clinical Trials Under Way:

- Alzheimer's disease: Dr. Russell Swerdlow, University of Kansas, US: Therapeutic Diets in Alzheimer's Disease (TDAD); Dr. Suzanne Craft, Wake Forest University, US: Brain Energy for Amyloid Transformation in Alzheimer's Disease Study (BEAT-AD).

- Anxiety: Dr. Adrian Soto-Mota, Instituto Nacional de Ciencias Medicas y Nutricion Salvador Zubiran, Mexico: The Effect of Two Dietary Interventions on the Symptomatic Control of People Living with Anxiety Disorders.
- Bipolar disorder: Dr. Shebani Sethi Dalai, Stanford University, US. Impact of a Ketogenic Diet on Metabolic and Psychiatric Health in Patients with Schizophrenia or Bipolar Illness; Prof. Harry Campbell, University of Edinburgh, Scotland: A Ketogenic Diet for Bipolar Disorder.
- Psychosis: Dr. Anu Ruusunun, Kuopio University Hospital, Finland: Ketogenic Diet for Psychotic Disorders (PsyDiet); Dr. Judith Ford, UC San Francisco, US: Can Neural Network Instability in Schizophrenia be Improved With a Very Low Carbohydrate Ketogenic Diet?
- PTSD: Dr. Jens Rikardt Andersen, University of Copenhagen, Denmark: Diet Induced Ketosis for Patients With Posttraumatic Stress Disorder (PTSD), a Feasibility Study.
- Substance abuse: Dr. Corinde Wiers, University of Pennsylvania, US. Relationship Between Brain and Heart Glucose Metabolism in Alcohol Use Disorder; Dr. Gene-Jack Wang, NIH, US: Ketogenic Diet in Alcoholism; Dr. Anders Fink-Jensen, Psychiatric Center Copenhagen, Denmark: Does a Ketogenic Dietary Supplement Reduce Alcohol Withdrawal Symptoms in Humans?

If this topic interests you, there are many resources available to support your learning and practice goals, including the following:

Clinical Guidelines for Therapeutic Carbohydrate Restriction compiled by Adele Hite, PhD, MPH, RD. Multiple clinician expert authors contributed to this living document which is focused primarly on the treatment of metabolic disorders. This is a free downloadable resource available in nine languages.

Ketogenic Diets for Mental Health Clinician Training Program: live, online, interactive, small-group CME course for clinicians of all backgrounds interested in incorporating the cutting-edge principles of metabolic and nutritional psychiatry into their care of people with psychiatric conditions.

Treating Metabolic Syndrome, Type II Diabetes, and Obesity with Therapeutic Carbohydrate Restriction: a free, online, video CME course for physicians. This activity is intended for physicians, physician assistants, registered nurses, and dietitians. Continuing education credits are approved for all of these professions.

Use of a Low-Carbohydrate, Ketogenic Diet to Treat Obesity: a 2018 clinical monograph by Duke University obesity medicine physician and low-carbohydrate clinician and researcher Eric Westman MD, et al.

If you have any additional questions about this topic or need help with a clinical case, I offer consultation services as well, so please feel free to contact me directly by email. I hope you have found this information helpful.

Sincerely,

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Dr. Georgia Ede is a Harvard-trained, board-certified psychiatrist specializing in nutritional and metabolic interventions for mental health conditions. She speaks internationally on ketogenic and other dietary strategies for psychiatric conditions, the nutritional differences between plant and animal foods, and public nutrition policy.

EVIDENCE BASE FOR THE USE OF KETOGENIC DIETS IN THE TREATMENT OF NEUROPSYCHIATRIC CONDITIONS

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