

Ketogenic Therapy for Brain Health

By: Christopher Palmer, MD, Charlie Foundation for Ketogenic Therapies

Introduction by Beth Zupec-Kania. I had the pleasure of meeting Dr. Chris Palmer at the 6th Global Symposium on Ketogenic Therapies in Jeju South Korea last year. We discussed his clinical work at McClean Hospital in Belmont, Massachusetts of applying ketogenic therapy in his psychiatric practice. He's a trailblazer in this field and agreed to author this blog for the Charlie Foundation.

KETOGENIC THERAPY FOR BRAIN AND MENTAL HEALTH

There are millions of people living with mental illness diagnosed under various psychiatric labels in the United States alone. These illnesses include clinical depression, bipolar disorder, obsessive compulsive disorder, schizoaffective disorder, and schizophrenia, to name just a few. Symptoms of these illnesses, the current diagnostic criteria for which often overlap with each other, include diminished or complete inability to experience joy, suicidality, mood instability, sleep disruption, delusions (firmly held beliefs which do not comport with reality), visual and auditory hallucinations (seeing and hearing things that others do not), disorganized thought process, memory impairment, anxiety, intrusive thoughts, and more.

These symptoms can be crippling. Mental illness normally manifests during the teens or twenties, striking young people just as futures are forming. For some, the onset of illness is a slow progressive decline. For others, the illness can have an acute onset. In either case, those who suffer and those who love and care for them see bright futures explode. Unfortunately, current standard treatments only address the symptoms, not the cause, and are not effective for a vast number of the ill. Given the bleak outlook, a diagnosis of mental illness can be devastating and scary for everyone involved.

The ketogenic diet can be very effective as a treatment for epilepsy and a number of other brain disorders. What are the possibilities it could be an effective treatment for mental illness? Although more research should be done to establish how and under what circumstances the ketogenic diet works for mental illness, there are some inspiring case reports and studies suggesting it can be an extraordinarily effective treatment. This conclusion may come as a surprise. However, in light of an evolving understanding that there is a bidirectional relationship between mental illness and epilepsy, the idea that there may be common treatments is not so surprising after all.

Mental and Medical Illnesses Are Not Necessarily Mutually Exclusive.

First ruling out a medical cause has long been heralded as the gold standard before initiating treatment for "purely mental" illness. However, the notion that mental illness is purely mental to the exclusion of a biological or so-called medical cause is open to question. There is good reason for the assertion of a biological basis for the psychiatric symptoms. There are well-documented common threads between mental, medical, and neurological illnesses. Those who suffer mental illness are far more likely than the unaffected population to also suffer cardiovascular disease,

diabetes, and obesity.^{[1][2][3][4][5][6][7][8][9]} Conversely, those with such medical conditions are more likely to develop a major mental illness in their lifetimes. (*Ibid.*)

By the same token, there is a similarly well-documented bidirectional relationship between epilepsy and a number of different psychiatric illnesses including major depressive disorder, mood disorders, anxiety disorders, dysthymia, panic disorder/agoraphobia.^{[10][11][12][13]} This means those who have been diagnosed with a mental illness are statistically more likely to either have epilepsy or develop it, and vice versa. As just one of many examples, patients with epilepsy develop psychosis or schizophrenia at a rate exceeding that expected if the two disorders were independent.^[14]

While it is tempting to disregard this bidirectional relationship, as if having a neurological disorder as serious as epilepsy would make anyone sad, anxious, or worse, the data also suggests that in many cases a diagnosis of a mental illness precedes the first seizure. A diagnosis of major depression was identified as a six-fold risk factor for later suffering unprovoked seizures (e.g., seizures not caused by head trauma, virus, or similar event).^[15] Similarly, an almost three-fold increase of the risk of suicide attempts was documented in cases *before* the diagnosis of epilepsy was made, and thereafter an additional two-fold increase risk for recurrent suicide attempts after the diagnosis.^[16] Suicide is three times more frequent in epilepsy patients than the unaffected population, and the depressive symptoms often precede the onset of epilepsy.^[17]

This does not mean that every person with epilepsy will have or develop a mental illness, or that every person with a mental illness will have or develop epilepsy. However, the data establishing the bidirectional relationship between these illnesses, both impacting the brain, does suggest a relationship worth exploring. The correlation between epilepsy and mental illness could yield important information about cause and effect, potentially shared or related pathophysiology, and of interest to many millions of those who suffer treatment resistant mental illness, *common therapies*.

Current Standard Treatments for Mental Illness

Medications are currently the first line treatment for mental illness, often with talk therapy and other behavior-based interventions. The following frustration about the current standard treatments for mental illness will likely resonate with people diagnosed with epilepsy, their caretakers, and medical providers. While the standard treatments for mental illness can be very effective for some lucky individuals, far too many people suffer treatment resistant mental illness. Some never experience any relief. In addition, of those who are lucky enough to find the right medication at the right dose and get some symptom relief in response to medications, the symptom relief is not always sustained over time on the same medications and many suffer medication side effects which can be profoundly impairing. Side effects can include tremendous weight gain, diabetes, and increased risk of cardiovascular disease, and, paradoxically, an increase in the very symptoms that the medications are supposed to be treating like paranoia, hallucinations and other psychotic symptoms, suicidal ideations, agitation, and impaired cognition. For those unlucky people who do not get relief from the medications and/or suffer serious medication side effects, the search for relief can be overwhelming. It can also be very hard to distinguish between medication side effects and the organic illness. After a mental

illness diagnosis, for those patients who spend years of seeking and not finding relief in the current standard treatments, it is understandable how despair can enter the picture. New treatment ideas are desperately needed.

Enter Doris and Hope: A Case Study Suggesting the Therapeutic Value of a Low Carbohydrate, Anticonvulsant Diet for Treatment of Chronic Mental Illness.

Despair had certainly set in for Doris, a 70-year old woman who had suffered severe symptoms of treatment resistant schizophrenia (with confirmed delusions and auditory and visual hallucinations) nearly her entire life. By the time she went to Duke University Medical Center for treatment of obesity and some other non-psychiatric conditions, her psychiatric history seemed quite hopeless with more than sixty years of suffering. That is, until by treating her for obesity her doctors fortuitously backed into a very effective treatment of her previously treatment resistant, chronic psychotic symptoms: the ketogenic diet.^[18]

Doris' History

At the tender age of 7, Doris suffered the first of many traumatic experiences which were to mar her entire childhood. While she should have been attending grammar school, painting rocks, and playing in the afternoons with school friends, she had a completely different lot in life. Just a young child, she walked into her house to see the shocking evidence of her mother's murder and in the years thereafter endured unimaginable violence herself including regular mental, physical, and sexual abuse and incest before she even entered puberty. This trauma took its toll. By the time she was 17, Doris was diagnosed with schizophrenia. She suffered delusions, hallucinations, and disorganized speech and thoughts. Estimating that her psychiatric symptoms emerged when she was around 7 years old during the chaos of her childhood, she reported regularly seeing skeletons and being barraged daily with auditory command hallucinations in the form of voices urging her to hurt herself. In the ensuing decades, her schizophrenia worsened. Over the course of her illness, she tried at least seven different antipsychotic and mood stabilizing medications beginning with her diagnosis at age 17, with little to no relief.

Her schizophrenia proved treatment resistant. Doris' despair over unrelenting symptoms led to at least six suicide attempts by medication overdose, cutting herself, and ingesting cleaning agents. By the time she was in her 60's, having suffered severe and chronic treatment resistant mental illness for nearly her entire life, she was hospitalized at least five times, suicidal and desperate.

In addition to schizophrenia, Doris also suffered obesity and a number of other physical conditions or illnesses for which she had been prescribed numerous additional medications. She went to see Drs. Bryan Kraft and Eric Westman for her non-psychiatric conditions including obesity. At the time, she was taking 4 mg of risperidone, an antipsychotic medication, but this along with the numerous other antipsychotics and mood stabilizers she had tried before did not resolve the persistent delusions, paranoia, and visual and auditory hallucinations.

For weight loss, Drs. Kraft and Westman put Doris on a strict low carbohydrate diet of no more than twenty net carbohydrates per day, with the majority of her calories derived from protein and fat on a calorie-restricted food plan. Although ketosis was not confirmed by blood or urine

testing, the 20 net carbohydrate and calorie restriction along with her confirmed weight loss suggests ketosis would have been sustained at least during the years she was losing weight. She shed more than 30 pounds over the course of the first year of treatment and continued to lose weight in the years following for a total weight loss of 150 pounds.

Doris: The Sounds of Silence.

After these dietary changes were made, and with no changes to any of the medications she was taking at the time, Doris reported a surprising result. Not only was she losing weight, she stopped hearing voices, seeing the skeletons she had hallucinated for so long disappeared, and her paranoia and delusions started to resolve. One morning, she awoke and realized that the distracting sounds and voices she had grown so accustomed to living with were no longer interfering with her perceptions. Instead, she heard birds chirping — and those birds were really were outside her home chirping! Amazed and delighted, she walked around her house hearing and noticing things she never could before because of all the mental “noise” she had lived with for so long. It was as if a veil between her and the real world had been lifted.

Doris: Ten Years Later.

Doris’ case report was published by Drs. Bryan Kraft and Eric Westman in 2009. (*Ibid.*) At the time of this article, ten years later, she mercifully remains symptom free. Doris no longer takes any antipsychotic medications. Having lost the weight she needed to, she is no longer calorie restricted. Consistent with the ketogenic diet treatment protocol for epilepsy, she was eventually weaned from a strict medical version of the ketogenic diet and remains symptom free on a less restrictive low carbohydrate diet.

After living with mental illness for so long, Doris’ relief from the chronic psychiatric symptoms has completely changed her life. She no longer wants to kill herself. Quite the contrary, she wants to live and agrees to share her story to help inspire others who suffer similarly to try this nutritional intervention. She and her doctors attribute the resolution of her life-long psychiatric symptoms to the dietary changes she made.

Doris’ relief from the symptoms of chronic schizophrenia after introduction of a low carbohydrate diet more commonly accepted as a treatment for medication-resistant epilepsy has inspired much conversation regarding the bidirectional relationship between epilepsy and mental illness, and what this could mean in terms of understanding both cause and treatment.

More Evidence for the Ketogenic Diet as a Treatment for Mental Illness.

While certainly among the more inspiring case reports, Doris’ case is by no means the only evidence supporting the use of the ketogenic diet in the treatment of mental illness. In 1965, a study was undertaken on ten women diagnosed with schizophrenia who were receiving medications and electroconvulsive therapy. The women were hospitalized and placed on the ketogenic diet for a month. The researchers reported symptom improvement at two weeks, and an increase in symptoms after the diet was stopped.^[19] More recently, in 2013 a case report was published describing two women with treatment resistant bipolar disorder, ages 30 and 69, who

were both able to stop medications (which were never effective for them to begin with) after introduction of the ketogenic diet. After two to three years on the ketogenic diet, they were doing much better than on medication treatment.^[20] In 2015, the ketogenic diet was reported to normalize the typical symptoms of schizophrenia (including both excitatory symptoms and withdrawal behaviors) in a mouse model study.^[21] In 2017, two additional case reports were published by the author of this article showing symptom relief in two patients (one male, one female) who each had suffered treatment resistant schizoaffective disorder for more than twenty years. On the diet, the symptoms were greatly improved. Off the diet, the symptoms returned.^[22]

Clearly, there is some physiological mechanism induced by the ketogenic diet, fasting, or even just weight loss which by inference corresponds with the presence of circulating ketones, with the power to improve the symptoms of psychiatric illness. These improvements are not limited to the psychotic disorders. Weight loss alone is associated with improvement in depression.^[23] There are numerous studies in epilepsy literature show improvement in depressive symptoms with the ketogenic diet – mental clarity, alertness, increased energy, improved sleep. In a rodent model study, the ketogenic diet had antidepressant effects.^[24] In 2009, a clinical study of the ketogenic diet versus low fat diet for weight loss showed that the ketogenic diet improved both vitality and mental health scores.^[25]

And of course, all one needs to do is review the rampant self-reports of those in the health and fitness world reporting an improvement in mental clarity and energy when following either a low carbohydrate or the more restrictive ketogenic diet. There is something more to the ketogenic diet than just weight loss and fitness.

Common Treatments: Anticonvulsant Medications Routinely Prescribed for Treatment of Mental Illness.

The fact that the ketogenic diet appears to be an effective treatment for mental illness is not all that surprising, considering the well accepted use of anticonvulsant medications to treat psychiatric disorders. In fact, the fields of epilepsy and psychiatry share many treatments. Depakote, Lamictal, Tegretol, Neurontin, and all of the benzodiazepines (medications like Valium and Ativan, commonly prescribed for anxiety) are all examples of anticonvulsant medications commonly prescribed in the treatment of psychiatric disorders. Given that the ketogenic diet is an established treatment for epilepsy, it's not unreasonable to think it might also help at least some people with psychiatric symptoms.

Epilepsy and Mental Illness: Common Biological Cause?

Given the overlap in occurrence of psychiatric illness and epilepsy and the crossover in treatments, interest is naturally turning to the potential for a shared physical cause. Indeed, many researchers are now concluding there may be possible common pathophysiology underlying anxiety and epilepsy.^[26] There is emerging interest in a potentially common cause between schizophrenia and epilepsy.^[27] Suggesting a genetic link, there is also strong evidence of clustering of the association between epilepsy and psychosis within families. Individuals with a

family history of epilepsy had more than a five-fold increase in the risk of having schizophrenia, and more than a six fold increase in the risk of having bipolar disorder.^[28] Given that both anticonvulsant medications and the ketogenic diet, an accepted anticonvulsant therapy, appear to have antidepressant, mood stabilizing, and antipsychotic effects, a shared biological basis between the disorders certainly makes sense. As we learn more about how and under what circumstances the ketogenic diet works for certain types of mental illness, that new understanding will help the sufferers of both mental illness and epilepsy.

Conclusion

More research is needed to understand the pathophysiological similarities between epilepsy and mental illness. More research is also needed to understand the nuances of how and under what circumstances the ketogenic diet, an accepted treatment for epilepsy, works as a treatment for mental illness. Given the established bidirectional nature of epilepsy and mental illness, and the apparent efficacy of anticonvulsant pharmaceutical therapies to treat both, it makes sense that the ketogenic diet can be an effective treatment worthy of consideration for mental illness too. The growing data certainly seems to suggest it is. And given the bidirectional relationship between epilepsy and mental illness, what is even more exciting is that for those who suffer both conditions the ketogenic diet may be one of the best “two-fers” around!

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Anne L. Rauch is a practicing lawyer in California who investigated both traditional and alternative treatments for mental illness to help a close family member who suffered an acute onset mental/metabolic illness at the age of 15. He is now on the medical ketogenic diet and doing much better. She founded The Paradox Foundation, a nonprofit, to support research into safe, effective treatments for mental illness.

WARNING: Nothing in this article is intended as medical advice. Anyone contemplating the ketogenic diet as a treatment for illness of any kind is urged to seek medical help from a competent medical provider trained in treatment of the underlying condition as well as the ketogenic diet therapy before initiating the ketogenic diet. The ketogenic diet induces significant metabolic changes which can impact medication metabolism, among other things. Individuals seeking treatment of any illness using the ketogenic diet will likely require additional support especially during the initial adaptation phase, and thereafter for the duration of treatment which can take years depending on a variety of factors.

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