

Case Report

Benefits of the ketogenic diet in postpartum psychosis

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ABSTRACT

Post-partum psychosis consists in the abrupt appearance of psychotic symptoms in this period. The treatment is a combination of multiple medications including lithium, antipsychotics, benzodiazepines and others. Ketogenic diet, is an intervention based on high fat, low carbohydrates, adequate protein aiming to generate ketosis, and recent studies shown promising benefits in several conditions besides the historically know in epilepsy. We presented a case of a patient with psychosis post-partum, who achieved a rapid, full remission of her symptoms with the standard medication plus the adoption of a ketogenic diet. A 22 year-old patient, 7 months postpartum of her third child, starts presenting manic behaviors, with delusions of grandiosity related to her religious beliefs and hallucinations and reduced need of sleep. It immediately started on medication, with benzodiazepines, olanzapine and lithium, with the adoption also of a strict ketogenic diet. In the following 3 weeks to achieve complete remission of her symptoms with no recurrence. In the treatment of postpartum psychosis, most used medications do not provide resolution in the totality of patients and also generate disturbances in the patients physical and mental health, as well as in breastfeeding and in the newborn's health. Ketogenic diet can be an effective and safe intervention, which may help in reducing the need for medications, improve the rate of remission and recurrence. Further systematic research may be needed to determine the role of this diet in such a negatively impacting condition.

Keywords: Ketogenic diet, Postpartum psychosis, Psychotic symptoms

INTRODUCTION

Postpartum psychosis is the abrupt appearance of any psychotic symptom, in the Postpartum setting, either as a first ever psychotic symptom, or an manic episode of a bipolar disorder, schizoaffective or schizophrenic disorder.¹ In the early editions of the DSM (I and II) it was classified as a separate condition, but it was later included among entities mentioned above as an 'specifier' named: "with Postpartum setting", a description that still today is not universally accepted.²

The treatment is one of the aspects that remain with no defined guidelines, and some interventions are still being studied. Although prevention and maintenance therapy with lithium, acute treatment with benzodiazepines and antipsychotics, are part of the most used medications, its adverse effects on the patients, breastfeeding, and the presence of recurrences, or persistence of symptoms in some patients, evidence the need for new options of treatments and interventions in this condition.³

The ketogenic diet is a high fat, low carbohydrate with adequate-proteins diet, that promotes the use of fat for generation of fatty acid and ketone bodies, the latter then

passes to replace glucose as the source of energy in the brain. Other changes related with this diet are seen in the microbiota, as well as the cell to cell communication in the brain, the proportion of the main neurotransmitters and inflammatory markers.⁴

It has historically been used for treatment of resistant epilepsy in children, with well-known efficiency. But in recent years several experimental studies have shown potential benefits in several other conditions, from metabolics to psychiatric ones.⁵

Although current approaches to screening, diagnosis, treatment, and prognosis of postpartum psychosis are successful most of the time, some patients present recurrences of psychotic or mood symptoms, which can cause significant morbidity, and the medication itself, even when effective, is not free of adverse effects. Notably, up to 50% of affected women present without identifiable pre-existing risk factors, and its prevention (in predisposed patients such as Bipolar patients), its recovery, and later consequences still require our attention.³ The ketogenic diet is a promising intervention that can potentially contribute to prevention, faster recovery, less adverse consequences for the patient and child, and fewer recurrences.

We presented a case of postpartum psychosis in which a ketogenic diet was used as an adjunctive intervention, highlighting its potential role in recovery and relapse prevention.

CASE REPORT

A 22 year-old patient, mother of three children 3 and 2 years and 7 months old, who is described by her husband and brother as person with low self-esteem, who always tries to please other, also with obsessive behavior related with her religious practices (previously to her marriage praying up to 5 times a day, and after getting married, reporting feels of guilt for not being able to do it in such ways) who is brought by her husband to the clinic, reporting that for the last 2 weeks, the patient was acting 'strange', only sleeping for 3 hours every night, obsessed with her religion and irritable, questioning the legitimacy of her marriage, and her competency as a wife, also making comments of guilt about her sexuality. Two days before coming to the clinic, the patient starts claiming she is 'the messiah', that on the street, the faces of people looked like traffic lights, also commenting 'I was on the un-holly place, now I come into purity', 'Hashem spoke to me, I must deliver his message' and ideas of the sort, also assuming rigid postures, and insinuating that the three children that she had were 'a mistake', all of which alarm her husband.

The patient and her husband state that after the first pregnancy she had a short period of racing thoughts and decreased need for sleep, but the episode resolved on itself without medication, but the husband agrees that this

is her first episode of this characteristic and magnitude. With no other significant finding on the interrogatory and the physical examination, the patient was diagnosed with a brief psychotic episode, and was started on medication. It was also discussed the possibility of a diagnosis of bipolar disorder.

She was immediately started on treatment with olanzapine, clonazepam and lithium was added 7 days later which resulted in almost complete resolution of her symptoms within two weeks according to the patient and her family. Her sleep routine was corrected, but still presented some bizarre thoughts. She also started a strict ketogenic diet 1 week after the start of the treatment, with the supervision of a nutritionist.

The patient was reevaluated 1 month after the episode, and had evidence of symptomatically and physical improvement, she had lost around 10 pounds in approximately 21 days, only persisting some obsessive thoughts, related to her marriage and motherhood, with no suicidal-ideation or depressive symptoms. By the time the patient reaches the 6 months after the episode, a year since the giving birth to her third child, the patient was completely free of symptoms, having lost close to 40 pounds of weight, still adhering to the diet and the medication, by this time olanzapine was discontinued, and remain on a low dose of lithium.

By the eight months post-episode, the patient remains free of symptoms, losing a total 45 pounds since the beginning of the diet, still taking care of her youngest child, and with significant improvement of the conditions of her marriage and her routines. By the time of this evaluation, the patient reported a 12 week new pregnancy, because of which it was advised strict following with her obstetrician for possible side effects on the new fetus of the medications used on the patient, and was instructed close monitoring of her previous psychiatric symptoms and prodromic manifestation to both the family and the patient.

DISCUSSION

Postpartum psychosis is the most severe psychiatric disturbance in the Postpartum period. Although suicide is not a frequent consequences, the attempts are usually of extreme violence, hence successful, and even when the homicidal conducts are neither much frequent, the mother-baby relationship, as well as the physical and mental health in the long term of both the mother and child, are significantly affected in most cases.¹ As we saw in this case, and other authors report, the onset is not necessarily in the first 4 weeks of the postpartum, having cases presented up to 6-9 months after, and in some extreme examples, more than 12 months after.⁶

Regarding the diagnosis, evidence suggest strong relationship with bipolar disorder, in up to 79% of cases, represents a manic episode of this condition, and the rest

of cases, can be catalogued as schizoaffective disorder and in a minor proportion, schizophrenia.⁷ This explains the reluctance of the use of medications such as antidepressants, and the effectiveness of medications like lithium, antiepileptic drugs and antipsychotics.⁸

For most patients with postpartum psychosis, the standard pharmacological management is generally effective. The guidelines recommend maintenance therapy for 9 months, even in the absence of symptoms, and in case of recurrence they recommend longer periods, even life long in some cases.⁹ The basic plan consists of benzodiazepines, antipsychotics, lithium and electroconvulsive therapy, in a sequential way.⁷⁻⁹ Although antiepileptic drugs have also been used, it is in very specific scenarios, related with bipolar disorder, which is not present in this case.⁴

Besides this, complete resolution is not always the case and is associated with well-known risks and adverse effects. In breastfeeding, there has been some concerns related to medications as lithium (which is recommended to be closely followed its levels and the appearance of symptoms of toxicity both in the mother and the newborn), the metabolic changes caused by the antipsychotics are also relevant, as well as the risk of recurrence and non-adherence. The maintenance phase with Lithium has shown in recent studies lower rates of recurrence compared to other plans.³ Considering this scenario, alternatives that are proven to be safe, effective, adaptable to different contexts and with no excessive costs, are welcome and needed in order to prevent the number of negative consequences for the patient, the newborn and their families, as well as the costs related to this situation. With its intrinsic limitations, this case suggests a potential role of a ketogenic diet. Of note, the patient remained symptom-free after 3 weeks of treatment with olanzapine and benzodiazepine plus lithium and the ketogenic diet.

The ketogenic diet is focussed on reducing carbohydrates, increasing the proportion of fat, with adequate protein content, aiming to generate a state of ketosis. Its effects in the energy metabolism of the brain cells are thought to be due to increase of the energy reserves, as ketone bodies are more efficient than glucose as fuel, but also the increased number of mitochondria. All of these may contribute to neurons remaining stable with the increase of energy demand, and also it might confer other neuroprotective effects.⁵ Ketones also reduce free radical formation and enhance antioxidant capacity, improving cellular resilience. Studies involving animal models show consistent decrease of the inflammatory markers which this diet, and it is also known the relation of these components with conditions such as depression, mania and psychosis. Beyond energy metabolism, ketone bodies function as signaling molecules that influence gene expression, inflammation, and neurotransmitter balance (specially norepinephrine and GABA have been shown changes with the diet).⁸

This intervention has shown promising benefits in prevention and treatment of condition as prevalent as diabetes mellitus, due to its effects on insulin resistance and metabolic syndrome, as well as dyslipidemias, all of which are theorised to be due to changes in the Intestinal microbiota of patients and animal models under its effects.⁹ Also it has been found possible uses in conditions such Alzheimer's disease, ALS, and mitochondrial disorders, in this case, related to the effects on inflammation markers expression and the modulation on the secretion of neurotransmitters as norepinephrine and dopamine as we mentioned before, the historically known impact on epilepsy is not yet completely understood, but similar theories are accepted, with the effects on the mitochondria being relevant as well.⁸

In scenarios as complex as the postpartum: only one of the elements alone (lack of sleep, the hormonal changes, the emotional impact of maternity, as well as the physical) can be enough to decompensate a previous psychiatric condition or generate disturbances as severe as psychosis. Adjunctive interventions targeting metabolic stability may offer a potential protective effect in this vulnerable period. This patient on ketogenic diet, showed a rapid improvement, in her symptoms, no recurrence, no adverse effects, no increase in weight (she lost approximately 40 pounds in 6 months) and was free on antipsychotic medication in only 4 months, with a low dose of lithium alone.

Regarding the limitations of this study, it should be acknowledged that the ketogenic diet is not free of adverse effects, as many studies have shown episodes of hypoglycemia, acidosis and constipation.¹⁰ Potential adverse effects must be carefully weighed, particularly in the postpartum period, and implementation should occur under medical supervision. Moreover, adherence to the diet was based on self-report, and no objective metabolic measures were available, and as this is a single-case observation, no causal relationship can be inferred, and the clinical improvement observed may reflect the natural course of postpartum psychosis or the effects of concurrent standard treatments during the acute phase.

These considerations highlight the need for cautious interpretation and for further systematic investigation before any broader clinical application.

CONCLUSION

This case describes a patient with Postpartum psychosis and previous psychiatric condition, who achieved complete remission of her symptoms after adopting a ketogenic diet and standard treatment. Without being able to establish causality, this raises the possibility of such intervention targeting the metabolic aspect of such conditions. Given the complexity of the matter and the intrinsic limitations of this study, further systematic research is needed to explore the safety, effectiveness and

possible role of ketogenic diet alongside established treatment.

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