

Challenging Case in Clinical Practice: Long-Term Relief from Chronic Posttraumatic Headache After Water-Only Fasting and an Exclusively Plant-Foods Diet

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Abstract

Chronic posttraumatic headache (CPTH) occurs in up to 95% of patients following traumatic brain injury (TBI) and can prove highly debilitating. The mechanism of CPTH is poorly understood, treatment protocols are not standardized, and the syndrome is difficult to manage. Here, the case is reported of a 52-year-old woman with unremitting CPTH. The patient underwent two medically supervised, water-only fasts and began an exclusively plant-foods diet, free of added sugar, oil, and salt, which resulted in long-term reduction in headache intensity, duration, and frequency. This case suggests that water-only fasting and dietary intervention have therapeutic potential in the treatment of CPTH and provides a basis for further studies.

Keywords: chronic posttraumatic headache, water-only fasting, dietary intervention

Introduction

Chronic posttraumatic headache (CPTH) is estimated to occur in 20–95% of patients following traumatic brain injury (TBI) and has variable clinical features that can prove debilitating.¹ Recent advances in pathophysiology research suggest that neurogenic inflammation following TBI might contribute to CPTH,^{1,2} but the underlying mechanism(s) have not been conclusively elucidated. Therefore, CPTH treatment plans, which include both pharmacologic as well as non-pharmacologic intervention, remain unstandardized.³ Although there is limited evidence that consuming a low-fat vegan diet might improve headache symptoms by reducing inflammation,⁴ dietary

intervention in CPTH cases is generally limited to the removal of headache triggers,⁵ and research on the effectiveness of dietary intervention is lacking. Here, the case is presented of a woman with a 16-year history of CPTH who achieved long-term relief following intervention with two medically supervised, water-only fasts followed by an exclusively plant-foods diet, free of added sugar, oil, and salt (SOS).

Case Presentation

In 2010, a 52-year-old woman presented with unremitting CPTH located bilaterally in the occipital-temporal regions. The headache was described as “dull and achy” with a pain level of 6–8/10 and without associated neurological symptoms. Her body mass index (BMI) was 33.1 kg/m², and serological values were unremarkable (Table 1). The CPTH began in 1994 after she sustained moderate TBI when a heavy metal bar struck her head. A neurologist diagnosed her with CPTH, as well as chronic pain and thoracic outlet syndromes based on electromyography, nerve conduction tests, and a diagnostic interview. The patient had previously taken pharmaceutical medications, including gabapentin, topiramate, pregabalin, desvenlafaxine, and acetaminophen with codeine, but they were discontinued because she had not experienced headache symptom relief. After learning about a potential link between inflammation and headache, she became interested in trying medically supervised, water-only fasting and dietary modification.

The patient was deemed an appropriate candidate for water-only fasting based on adequate nutrient and electrolyte reserves, normal creatinine and hemoglobin levels, a normal glomerular filtration rate, and no contraindicating conditions (i.e., severe anemia, porphyria, serious malnutrition, medium-

Table 1. Immediate and Long-Term Effects of Fasting and Diet on CPTHA, BMI, BP, and Select Serological Values

(Ref. range)	Fast #1		Fast #2		Follow-up	
	Day 0	Day 37	Day 0	Day 37	3 month	5 year
HA intensity (0–10)	6–8/10	3/10	6/10	1/10	1/10	1/10
HA duration (0 min–constant)	Constant	<1 h	≥15 min	<10 min	<10 min	<10 min
HA frequency (never–daily)	Daily	Daily	Daily	Infrequent	Infrequent	Infrequent
BMI (18.5–24.9 kg/m ²)	33.1	26.9	23.7	18.8	20.2	22.1
Systolic BP (90–120 mm Hg)	118	106	98	78	92	106
Diastolic BP (60–80 mm Hg)	78	64	68	65	58	67
Sodium (135–146 mmol/L)	141	142	141	137	144	143
Potassium (3.5–5.3 mmol/L)	4.2	3.8	4.1	3.5	4.3	4.1
Creatinine (0.4–1.2 mg/dL)	0.7	0.6	0.7	0.9	0.6	0.6
eGFR (>60 mL/min)	>60	>60	>60	>60	>60	>60
SGOT (0–40 IU/L)	18	67	29	36 ^a	19	20
SGPT (0–50 IU/L)	14	46	21	22 ^a	14	15
Hemoglobin (12–16 g/dL)	13	15.2	13.4	13.6	13.8	11.8 ^b
WBC (4.5–11.5 K/μL)	7	6.2	6.6	3.8	5.6	4.5

^aValues were obtained on day 31.^bRef. range is 11.1–15.9 g/dL.

HA, headache; BMI, body mass index; BP, blood pressure; eGFR, estimated glomerular filtration rate; SGOT, serum glutamic oxaloacetic transaminase; SGPT, serum glutamic pyruvic transaminase; WBC, white blood cells.

chain acyl CoA dehydrogenase deficiency, pregnancy, or lactation).⁶ During the water-only fast, she completely abstained from all foods and beverages with the exception of distilled water ad libitum (minimum of 40 ounces daily) and rested to reduce energy expenditures and minimize complications. Medical staff monitored her weight daily, blood pressure and vital signs twice per day, and serological values and ketone levels weekly. She experienced common mild reactions, such as feeling cold, fatigue, presyncope, and nausea, especially at the beginning of the fast. She had one chiropractic treatment, one trigger-point therapy session, and one massage therapy session. The fast ended on day 41 and was followed by a 20-day, supervised refeeding, which transitioned from fresh fruit and vegetable juice to steamed vegetables to an exclusively plant-foods, SOS-free diet. Throughout the fast, there were no serious complications. The patient's serological values remained stable, with the exception of elevated liver enzymes and slightly reduced serum potassium, and her BMI and blood pressure reduced from 33.1 to 26.9 kg/m² and 118/78 to 106/64 mm Hg, respectively (Table 1). There were no obvious signs of muscle wasting, and her strength returned upon refeeding. Her CPTHA symptoms decreased in intensity from 6–8/10 to 3/10 and in duration from constant to <1 h (Table 1). After refeeding, the headaches still appeared on a daily basis, but the patient experienced headache-free periods each day. The gradual and progressive reduction in headache symptoms encouraged her to continue the exclusively plant-foods, SOS-free diet and return for another water-only fast.

After six months, the patient underwent a second water-only fast of 40 days followed by a 20-day refeeding, as described above. She also had one chiropractic treatment. During the fast, she experienced common mild reactions. There were no serious complications, and her serological values remained stable, with the exception of slightly elevated liver enzymes and reduced serum potassium (Table 1). There were no obvious signs of muscle wasting, and her strength returned upon refeeding. Her BMI and blood pressure reduced from 23.7 to 18.8 kg/m² and 98/68 to 78/65 mm Hg, respectively (Table 1). Remarkably, her CPTHA symptoms decreased in intensity from 6/10 to 1/10, duration from at least 15 min to <10 min, and frequency from daily to infrequent (Table 1). The improvement remained throughout refeeding. At the three-month follow-up, the patient reported compliance to the exclusively plant-foods, SOS-free diet, and her headache intensity (1/10), duration (<10 min), and frequency (infrequent) and BMI (20.2 kg/m²) remained stable (Table 1). At the five-year follow-up, the patient reported dietary compliance with minimal exceptions. Her headache symptoms remained unremarkable, and she maintained a normal BMI and blood pressure of 22.1 kg/m² and 106/67 mm Hg, respectively (Table 1).

Discussion

The case has been reported of a woman with a 16-year history of CPTHA who experienced a remarkable, long-term reduction in the intensity, duration, and frequency of headache symptoms

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following two extended water-only fasts and implementation of an exclusively plant-foods, SOS-free diet. Extended water-only fasting was implemented because, in the authors' clinical experience, it is more effective in treating intractable, chronic conditions than intermittent or modified fasting. During water-only fasting, distilled water is used preferentially over other water types (e.g., natural spring water) because it eliminates the potential of reactivity to substances, including minerals or contaminants (e.g., microorganisms and pollutants). It is unusual to repeat extended water-only fasts with only a six-month intervening period. However, the treatment plan was chosen because the patient's headache symptoms progressively improved as her first fast continued, there was no apparent health risk, and she was motivated.

It is common for serum potassium levels to decrease during prolonged water-only fasts.⁷ Therefore, patients are routinely monitored for hypokalemia, and supervised refeeding is begun as necessary. This patient experienced a minor reduction in potassium levels during both fasts, but the levels did not fall below the normal range and were optimal at the start of the second fast and at the three-month follow-up. As such, there was no clinical reason for concern. It has also been found that liver enzymes can increase during water-only fasting, even in the absence of liver disease. During the patient's first fast, there was a significant increase in serum glutamic-oxaloacetic transaminase and a suboptimal increase in serum glutamic-pyruvic transaminase levels, but the levels decreased before the second fast and had further reduced to optimal, pre-fast levels at the three-month follow-up. There were no associated symptoms of disease, and there was no clinical reason for concern. It is difficult to rule out spontaneous remission in this case, but the specific correlation between CPTHA symptom improvement and water-only fasting on both occasions suggests that water-only fasting has therapeutic potential in the treatment of CPTHA.

The mechanism behind how fasting and dietary intervention could alleviate CPTHA symptoms remains to be determined. However, research indicates that fasting induces a number of potentially health promoting biological changes, including ketogenesis, hormone modulation, decreased oxidative stress and inflammation, and increased stress resistance, lipolysis, and autophagy.⁸ Additionally, emerging clinical evidence suggests that water-only fasting combined with dietary modification can effectively treat a variety of inflammatory health conditions.⁸⁻¹⁰ Although there are currently no clinical studies investigating the effects of fasting on headache or CPTHA, research suggests that modified fasting can improve chronic pain syndrome, possibly by increasing production of neurotrophic factors.¹¹ Furthermore, fasting was shown to upregulate neuroprotective proteins such as

brain-derived neurotrophic factor (BDNF), which modulates pain¹² and potentiates neurogenesis in rats¹³ while reducing pro-inflammatory cytokines and brain damage incurred by stroke in mice.¹⁴ Thus, modulation of neurotrophic factors is one possible explanation for how fasting might alleviate CPTHA symptoms.

This case demonstrates patient willingness to undergo extended water-only fasting and comply with dietary intervention for prolonged periods of time. It also indicates that extended water-only fasting and refeeding can be safely implemented under medical supervision and provides a basis for further research on water-only fasting and dietary intervention in the treatment of CPTHA. ■

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