

Case Report

Herbal Supplements Association with Reversible Cerebral Vasoconstriction Syndrome: A Case Report

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Background: Reversible cerebral vasoconstriction syndrome (RCVS) is a clinico-radiologic syndrome characterized by thunderclap headache and reversible multifocal arterial constrictions that resolves within 3 months. RCVS can be either spontaneous or related to a trigger; vasoactive drugs including over-the-counter medicine are common culprits. Nevertheless, there are sparse data on the association of herbal supplements in the genesis of unexplained RCVS. *Methods:* We describe a case of RCVS with a temporal association with the consumption of a diet pill composed of green tea, L-carnitine, and conjugated linoleic acid. We reviewed the literature describing RCVS cases associated with consumption of herbal supplements or plants. *Results:* A 50-year-old black woman presented at the emergency room with a thunderclap headache less than 1 week after beginning a new herbal supplement with weight loss purpose. Angiographic study revealed multiple arterial constriction of virtually all intracranial territories that were reversed 28 days later. The patient was discharged with minimal symptoms. From our review, we identified 5 previous reports of herbal product-related triggers. *Conclusions:* Different factors can trigger RCVS. Besides our case, at least 5 other nutraceutical products were described to be associated with the disorders, 3 of them in patients without any other clear cause. Clinicians should be aware of the possible role of herbal supplements in RCVS, and their use should be systematically assessed in large RCVS cohorts to clarify this association. **Key Words:** Reversible cerebral vasoconstriction syndrome—triggers—RCVS—nutraceuticals—herbal supplements.

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Introduction

Reversible cerebral vasoconstriction syndrome (RCVS) is a clinico-radiologic syndrome characterized by severe headache with or without accompanying neurological symptoms and reversible multifocal arterial constrictions that resolves spontaneously within 3 months.¹ Even if “benign” forms characterized only by thunderclap headache are described, parenchymatous hemorrhage or cerebral infarction can occur in up to 40% of the cases with a potentially fatal outcome.^{1,2}

At least half of RCVS cases occur post partum or with the use of vasoactive drugs.^{1,3} Serotonergic (e.g., antidepressants) and adrenergic (e.g., nasal decongestants) drugs are commonly implicated in RCVS.^{1,3} Also, in 1 series, in up to 20% of all admitted patients, RCVS was triggered by the use of cannabis, increasing awareness for previously unrecognized causes.³ Currently, a trigger is not recognized in about half of cases; even if a spontaneous form of RCVS could exist, it is possible that the recognition of pharmacological or environmental RCVS triggers is missed by the lack of knowledge on a possible association. In fact, during the last years, the number of agents associated with RCVS has been increasing, with individual case reports referring to herbal supplements as a possible RCVS trigger.⁴

We report an RCVS case temporally associated with an herbal supplement with weight loss purpose composed of green tea, L-carnitine, and conjugated linoleic acid (CLA), and reviewed previous reports of RCVS associated with herbal supplements.

Methods

We searched PubMed from inception to June 2016 for potentially eligible studies. We used the string “reversible* AND vasoconstrict* AND (cerebral OR brain OR encephali* OR encephalo*) OR (“reversible cerebral vasoconstriction syndrome”).” We screened titles, keywords, and abstracts retrieved from electronic search, and obtained potentially suitable reports for further evaluation. References were analyzed to identify further reports. We included studies reporting RCVS cases that reported a use of any herbal supplement or plant-derived supplement with a temporal relationship with the acute episode. We excluded studies without information on the trigger.

All observational studies, case reports, and case series were considered, irrespective of language.

Case Report

A 50-year-old black woman was admitted in an emergency room with the sudden onset of a severe holocranial pulsatile headache that wakes her up from sleep. The headache did not improve with analgesia and was accompanied by nausea, photophobia, and phonophobia. The patient had a history of high blood pressure and migraine without aura,

and there was no history of alcohol, tobacco, or other drug use. She was not on any prescription drug and had started in the previous week an herbal supplement—BioActivo Slim Duo—composed of green tea, L-carnitine, and CLA. On admission, the physical examination was unremarkable except for the presence of high blood pressure (195/112 mm Hg). A computed tomography scan showed a sylvian subarachnoid hemorrhage (Fig 1, A), and the patient was transferred to our hospital for neurological and neurosurgical evaluation. On the following 48 hours, the patient had at least 2 new episodes of headache and developed a right hemiparesis Medical Research Council (MRC) grade 4. At this time, a magnetic resonance imaging revealed an additional occipitoparietal right hematoma (Fig. 1, B).

Based on a possible diagnosis of reversible cerebral vasoconstriction syndrome, a digital subtraction angiography was performed on the patient 4 days after the onset of symptoms (Fig. 1, C), which revealed multiple arterial constrictions of virtually all intracranial territories with no evidence of aneurysm or vascular malformations. This reinforced the diagnosis of RCVS, and the patient was managed accordingly with blood pressure management and oral nimodipine. No other headache episodes or new focal neurological signs were observed until discharge, 28 days later.

Laboratory tests including blood count, lupus anticoagulant, anticardiolipin, anti-B2-GP, kidney function, liver function, complement, cryoglobulins, rheumatoid factor (RF), antinuclear antibodies (ANAs), anti-neutrophil cytoplasmic antibodies (ANCA), human immunodeficiency virus (HIV), hepatitis C virus (HCV) and hepatitis B virus (HBV) had no significant changes, and CSF study was normal. At day 28, an MR angiography was performed and showed a complete regression of vascular constrictions (Fig. 1, D), confirming the diagnosis of RCVS, and the patient was discharged with a modified Rankin Scale of 1.

Results

From a total of 467 publications screened, 4 case reports⁵⁻⁸ fulfilled our inclusion criteria. A fifth report⁹ of cerebral vasoconstriction was identified with cross-reference, but this report did not provide evidence of vasoconstriction reversibility.

Discussion

We describe the temporal association of VS with the start of a weight loss pill composed of green tea, L-carnitine, and CLA. From our literature review, we identified 4 more reports of herbal supplements that were associated with RCVS, and besides our case, in 2 reports there was no clear cause for RCVS.^{6,7}

First of all, we acknowledge the limitations of our literature review as it was biased to cases where the words “reversible” and “vasoconstriction” were in the title, abstract, or keywords. The use of the expression “RCVS” is

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