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CASE REPORT

Herbal remedies as a potential cause of hypoadrenalism

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Abstract

A 37-year-old woman presented with nausea, vomiting and headache. She was found to be profoundly hyponatraemic with a sodium of 121 mmol/L, which deteriorated following a fluid challenge. An initial hyponatraemia screen identified adrenal insufficiency, with cortisol of 48 nmol/L. History confirmed she had been taking the herbal plant, ashwagandha. After 3 days of fluid restriction and steroid replacement, her sodium returned to normal (139 mmol/L). This article reviews the possible harmful effects of over-the-counter herbal remedies and highlights the importance of considering a wide differential diagnosis in patients presenting with non-specific symptoms.

Key words: Herbal remedies; Hypoadrenalism; Hyponatraemia; Ashwagandha; Complimentary therapies

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Introduction

A young woman presented with non-specific symptoms. She was found to be profoundly hyponatraemic with a sodium of 121 mmol/L, which worsened to 118 mmol/L after an intravenous fluid challenge. An initial hyponatraemia screen identified a cortisol of 48 nmol/L. After 3 days of fluid restriction and steroid replacement, her sodium returned to normal range (139 mmol/L). Further history revealed that she had been taking the herbal plant, ashwagandha. A literature review revealed that this can lower serum cortisol highlighting the potential harmful effects of such over-the-counter herbal remedies.

Case report

A 37-year-old lady presented with a history of nausea, vomiting and severe headache. She was dizzy on standing and generally weak. This was on a background of chronic fatigue, anxiety and poor sleep for which she had been self-medicating with ashwaganda herb and Lion's mane for around two years. In addition, she had recently started taking high-strength iodine (Lugol's).

Her past medical history included primary hypertension, for which she was taking atenolol sporadically; and generalized abdominal symptoms, previously investigated by her general practitioner (GP). She smoked 10 cigarettes a day and drank occasional alcohol. On examination, she appeared clinically euvolaemic and had subtle neurological symptoms with mild confusion, blurred vision and slowness of thought, which seemed inappropriate for someone of her demographic.

Admission bloods returned a sodium of 121 mmol/L. The initial working diagnosis was salt depletion secondary to nausea and vomiting, causing symptomatic hyponatraemia. As such, she was treated with 500 mL of normal saline over 4 hours, and a panel of tests were arranged including serum and urine paired osmolarities, renin, cortisol and thyroid function. Following this treatment, her sodium fell to 118 mmol/L, with worsening confusion. She went on to have a computerized tomography scan (CT) of her head which was unremarkable.

Further results showed a urine sodium of 94 mmol/L and osmolality of 400 mmol/L, in keeping with SIADH. Due to the severity of hyponatraemia and worsening symptoms, she was transferred to Intensive Care and started on a fluid restriction of 1 L/day with the aim of improving her sodium by a maximum of 8 mmol/L every 24 hours.

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Case report (Continued)

Subsequently, the random serum cortisol returned as 48 nmol/L, with the working diagnosis switching to adrenal insufficiency. She was given an intravenous dose of 50 mg of hydrocortisone and her sodium rapidly improved to 131 mmol/L. Urine output was subsequently matched with 5% dextrose with the aim of preventing the potential effects of rapid correction.

Further investigations showed a thyroid stimulating hormone (TSH) level of 12.1 mIU, a free T4 of 16.2 pmol/L and normal prolactin, adrenocorticotropic hormone (ACTH), follicle-stimulating hormone (FSH) and luteinizing hormone (LH) levels. Her subclinical hypothyroidism was felt to be irrelevant, as Lugol's iodine can disturb TFTs.

She was discharged with oral hydrocortisone and endocrine follow up. Investigations were repeated as an outpatient, with a normal magnetic resonance imaging (MRI) scan of her pituitary, repeat pituitary profile and serum sodium. A short-synacthen test following the suspension of her hydrocortisone showed some improvement in her cortisol but not complete resolution; therefore, steroid replacement was continued.

Discussion

Ashwagandha is an evergreen shrub, with W. Somnifera, thought to be the active component (Mishra et al, 2000). Ashwagandha has been marketed as an adaptogen to reduce stress and improve sleep (Langade et al, 2019; Lopresti et al, 2019a). Existing research suggests that ashwagandha does this through influencing the hypothalamic-pituitary-adrenal (HPA) axis (Chandrasekhar et al, 2012; Lopresti et al, 2019a; Fry et al, 2022).

Fry et al (2022) reported a case of a young woman taking ashwagandha supplements, with a resultant reduction in her cortisol on a synacthen test. Furthermore, Chandrasekhar et al (2012) completed a double-blinded randomized placebo-controlled trial, which found ashwagandha reduced cortisol levels. However, not all the evidence is in agreement, with Lopresti et al (2019b) finding no statistical difference biochemically or symptomatically between ashwagandha and placebo groups. Although it is not possible to conclude the cause of hypoadrenalism in this case, a potential cause is ashwagandha; in line with its known influences on the HPA-axis and existing literature.

The use of herbal medications is increasing, with ease of access and with public perception broadly that herbal medications are efficacious and safe. However, these medications have biologically active components, and physiological effects and can interfere with other medications, with potentially serious complications (Shaw et al, 2012; Ekor, 2014). This case highlights the need for regulation and research into the use of herbal medications.

This case also exemplifies the challenges of managing hyponatraemia and clinically determining between hypertonic, isotonic or hypotonic hyponatremia before biochemical results are available. Close sodium monitoring and a wide panel of initial investigations allowed recognition of deterioration and switching treatment. Highlighting the importance of careful sodium monitoring, especially with diagnostic uncertainty (Liamis et al, 2011; Sterns, 2020). Furthermore, this case reminds us to consider hypoadrenalism in non-specific presentations.

Conclusions

This is a case of a young woman who presented severely unwell with hyponatraemia secondary to hypoadrenalism, requiring an intensive treatment unit (ITU) admission. A possible cause of her hypoadrenalism was the herbal supplement ashwaganda interfering with her hypothalamic pituitary axis. This highlights the need for further research into ashwaganda and other herbal medications with regards to their potentially harmful effects with distribution of this information to the public to raise awareness of the potential health risks of unregulated products.

Moreover, it is a reminder of the importance of casting a wide net in the investigation of hyponatraemia given difficulties in accurate clinical assessment of fluid status. It further highlights the importance of close monitoring of biochemistry especially after intervention in hyponatraemia. This ensures the trend of sodium is in the right direction and prompts

timely changes in working diagnosis and subsequent management plans. This prevents unrecognized deterioration with potentially catastrophic consequences.

Learning points

- Importance of taking a medication history including herbal supplements when assessing patients.
- To consider the potential biological effects of herbal medications or over the counter medications.
- Importance of recognizing hypoadrenalism in non-specific presentations.
- Difficulty in clinically diagnosing the cause of hyponatraemia and the importance of biochemistry.
- Importance of monitoring sodium levels when the cause of hyponatraemia is unclear so as not to cause rapid increments and to monitor response to treatment, and stop if causing a deterioration.

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Availability of data and materials

All the data of this study are included in this article.

Author contributions

MP, RN, MH and RR designed the research. MP drafted the manuscript. All authors contributed to important editorial changes in the manuscript. All authors read and approved the final manuscript. All authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

Ethics approval and consent to participate

All participants signed an informed consent form.

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Conflict of interest

The authors declare no conflict of interest.

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