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Panic Attacks in HYPERALDOSTERONISM

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ABSTRACT

Panic attacks and panic disorders are common in the general population. However, the presence of panic attacks associated with primary hyperaldosteronism has been rarely documented. We describe a patient with new-onset hyperaldosteronism secondary to adrenal adenoma who presented with recurrent panic attacks. The patient underwent adenoma resection, which was the definitive cure for the patient's hyperaldosteronism and panic attacks. Clinicians should include hyperaldosteronism on the differential for medical etiologies of panic attacks. Further research is needed to elucidate the mechanistic relationship between primary hyperaldosteronism and panic attacks.

KEYWORDS: Primary hyperaldosteronism, panic attack, panic disorder, adrenal adenoma

Panic attacks and panic disorders are common in the general population, and the lifetime prevalence estimates in the United States are 22.7 percent for isolated panic attack without agoraphobia and 3.7 percent for panic disorder without agoraphobia.[1]

Primary hyperaldosteronism is the most frequent cause of secondary hypertension,[2] and it has been found in 5 to 12 percent of patients with high blood pressure.[3–6] However, there are few case reports that document and characterize panic attacks associated with primary hyperaldosteronism.

During a panic attack, a patient experiences physical sensations associated with anxiety, including dizziness or faintness, pounding heart, shortness of breath, and/or chest pain.[7] These physical symptoms are interpreted by the body as red flags and cause the brain to activate the sympathetic nervous system, which can result in hypervigiliance about bodily sensations, amplified physical sensations, and heightened anxiety, ultimately creating a full panic attack.[8] Panic disorder has been associated with many medical disorders, including mitral valve prolapse, migraine headaches, asthma, vestibular abnormalities, and hypertension.[9] Panic disorder is one of the most common anxiety disorders in the general population.[7]

We describe a patient with new onset hyperaldosteronism secondary to adrenal adenoma who presented with recurrent panic attacks. The panic attacks resolved with surgical resection of the adenoma. This case was thought to be of considerable clinical importance due to the few existing documented cases.

CASE PRESENTATION

A 60-year-old male patient with a history of hypertension and newly diagnosed primary hyperaldosteronism due to adrenal adenoma presented to the emergency department due to elevated blood pressure (BP), with systolic BP in the 220s. The patient reported experiencing several episodes of hypertensive urgency over the last month, following diagnosis of hyperaldosteronism, with multiple admissions to various emergency departments. Medical and social histories were obtained from the patient and from previous medical records.

The patient was a self-employed consultant living alone. He was divorced with two children and one granddaughter. He denied using alcohol, tobacco, or other recreational drugs. Prior to onset of hyperaldosteronism, he was being treated for hypertension, controlled with amlodipine. He reported checking his BP regularly and was told by his primary care physician to take clonidine when his BP became elevated. The patient reported general good health and athleticism, which included 17-mile hikes every weekend. His low resting heart rate was likely due to his athleticism.

The patient had been admitted to the hospital a month and a half prior to this admission for hypertensive urgency, during which he underwent imaging that revealed bilateral adrenal nodules, as well as chemical testing

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that was positive for hyperaldosteronism. At diagnosis, the patient's aldosterone/renin ratio was 145.5 (normal range 0.9–28.9). His BP medication was switched from amlodipine to nifedipine, and he was also started on spironolactone and valsartan.

The patient was prepared to undergo adrenalectomy during this admission. Psychiatry services were consulted on Day 5 of admission for management of anxiety. The patient, with no prior history of anxiety or other psychiatric diagnosis, experienced panic attacks that he described as increasing episodes of feeling a rising sensation starting at the pelvic area and rising up to his head with sensations of heat, cold, pain, shivering, muscle aches, palpitations, increased heart rate and BP, and migraines, with concomitant anxiety, irritability, crying, and sadness. These episodes would build for 15 to 20 minutes before reaching maximum intensity. They initially occurred once a month and increased to daily frequency. The occurrence of the panic attacks preceded knowledge of the diagnosis of hyperaldosteronism or of the need for surgery. The frequency and intensity of the attacks continued to increase until surgery, and did not appear to be affected (i.e., increase at an accelerated rate) by the patient's knowledge of the diagnosis or surgery date. The episodes did not have any identifiable trigger and could happen at any time, even during sleep. His primary care physician had prescribed buspirone 10mg three times per day for these episodes before the formal diagnosis of hyperaldosteronism had been made. The patient was generally against using medications, especially psychiatric ones, and thus took buspirone irregularly, saying it provided minimal relief. He denied depressed mood or any other negative mood outside of these panic attacks. He also reported episodes of intermittent insomnia and hypersomnia.

The patient was started on propranolol 10mg three times per day on Day 4 of his hospital admission. The patient's buspirone regimen was changed from 10mg three times daily to 15mg three times daily, as needed, due to insufficient relief from symptoms at 10mg. His spironolactone dose was also increased from 50mg twice per day to 100mg twice per day by the consulting nephrology team. After three days of treatment with propranolol and increased spironolactone, the patient reported milder symptoms compared to previous days. He continued to experience panic attacks daily, but these episodes were now shorter in duration, lasting 10 to 15 minutes, and his BP only rose to around 140/80. He also noted that his emotions felt less intense. He was able to practice mindfulness during the panic attacks and coach himself through them. He denied adverse effects of propranolol. Because the patient had a low resting heart rate (50–60bpm), the dosage of propranolol could not be increased further. On Day 10 of the admission, the patient underwent left adrenal adenoma resection.

Adenoma resection resolved the patient's hyperaldosteronism. At postoperative follow-up after one week, the patient also reported resolution of his symptoms of anxiety and had not experienced further panic attacks. Repeat measurement of aldosterone levels was not performed at the hospital. On psychiatric telephone follow-up four weeks postsurgery, the patient reported he was off propranolol and all other medications, except losartan, which was being titrated. He had not experienced a panic attack since surgery and felt that he was completely back to normal. He returned to work and reported living a "full and happy life."

DISCUSSION

To the authors' knowledge, there is only one other report linking primary hyperaldosteronism to panic attacks. A study from 2006 studied 10 consecutive, newly diagnosed patients with primary hyperaldosteronism, four of whom had an aldosterone-producing adenoma similar to our case.[10] Of these, only one was associated with panic disorder; generalized anxiety disorder was detected in six cases, and obsessive-compulsive disorder was detected in one.[10]

In regard to hyperaldosteronism being linked to anxiety, Sonino et al[11] investigated psychological correlates in a population with primary hyperaldosteronism. Twenty-three patients with primary hyperaldosteronism were compared to 23 patients with essential hypertension and 23 matched normotensive subjects.[11] Twelve of 23 patients (52.2%) with primary hyperaldosteronism had an anxiety disorder compared to 4 of 23 patients (17.4%) with essential hypertension and one control (4.3%), suggesting that hyperaldosteronism is implicated in anxiety and stress.[11] In another study, Apostolopoulou et al[12] found a higher prevalence for depression and anxiety in patients with primary hyperaldosteronism, compared to the normal population, and female individuals seemed to be more affected than male individuals.

More broadly, glucocorticoids and other steroids produced in the adrenal cortex are altered in situations associated with increased anxiety. An increase in cortisol release is known to occur during panic attacks.[13] However, little is known about aldosterone and anxiety, with exception of a study from 2008 showing a significant negative correlation between morning salivary aldosterone concentrations and trait anxiety scores in women, but not in men.[14]

A review on the psychopathological symptoms in patients with primary hyperaldosteronism by Kunzel[15] revealed that though the exact mechanistic pathways of psychiatric comorbidities (e.g., anxiety, depression) in patients with primary hyperaldosteronism have not been elucidated, the renin-angiotensin-aldosterone system appears to play a role[15] and is an important target for future research in this area.

CONCLUSION

Panic attacks and panic disorders are common in the general population. The presence of panic attacks associated with primary hyperaldosteronism has been rarely documented. We report a case s in which new-onset hyperaldosteronism secondary to adrenal adenoma was linked to the development of recurrent panic attacks. Clinicians should include hyperaldosteronism in the differential diagnoses when treating medical etiologies of panic attacks. Further research determining the role of mineralocorticoids in the development of panic attacks is indicated.

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