Case Report

COCAINE-INDUCED PITUITARY APOPLEXY AND PANHYPOPITUITARISM

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ABSTRACT

Objective: Chronic cocaine use has been implicated in panhypopituitarism. Acute cocaine intoxication resulting in pituitary apoplexy and panhypopituitarism has not been reported in the literature.

Methods: We hereby report a case of panhypopituitarism resulting from pituitary apoplexy induced by a single intranasal cocaine use.

Results: A 54-year-old African American man presented with a week-long headache that started 2 hours after snorting a gram of cocaine. His physical exam was normal. His labs were suggestive of panhypopituitarism. Anti-neutrophil cytoplasmic antibodies were negative. Brain magnetic resonance imaging with and without contrast showed a large complex sellar mass with hemorrhagic and necrotic components. Surgical decompression was deferred due to normal visual acuity and absence of visual field defects. He received a stress dose of glucocorticoids followed by maintenance dose and was discharged on the glucocorticoid with levothyroxine replacement. The patient has been lost to follow-up.

Conclusion: Although the association of cocaine use with myocardial infarction and stroke has been well described, pituitary apoplexy and panhypopituitarism resulting most likely from severe vasoconstriction of hypophyseal vessels need special mention. We suggest that the diagnosis of cocaine-induced pituitary apoplexy should be considered in subjects presenting with severe headaches after cocaine inhalation. **(AACE Clinical Case Rep. 2015;1:e127-e130)**

Abbreviations:
ANCA = anti-neutrophil cytoplasmic antibody; **CIMDL** = cocaine-induced midline destructive lesion; **WG** = Wegener's granulomatosis

INTRODUCTION

Pituitary apoplexy is a rare but life-threatening clinical syndrome characterized by sudden headache, visual impairment, ophthalmoplegia, and altered mental status caused by rapid enlargement of a pituitary adenoma due to hemorrhage or infarction (1,2). Eighty percent of cases occur in patients with previously undiagnosed pituitary adenomas, with precipitating factors usually being antithrombotic therapy, arterial hypertension, head trauma, coronary artery surgery, other major surgery, pregnancy, gamma-knife irradiation, and coagulopathy secondary to liver failure (3,4). Chronic cocaine use has been implicated in panhypopituitarism, with the presence of human neutrophil elastase (HNE) anti-neutrophil cytoplasmic antibody (ANCA)–associated granulomatous inflammation of the pituitary in one case and pituitary necrosis in the other case (5,6). However, acute cocaine intoxication resulting in pituitary apoplexy and panhypopituitarism has not been reported in the literature.

CASE REPORT

A 54-year-old African American man presented to the emergency room with the chief complaint of headache that started 2 hours after snorting a gram of cocaine and had been ongoing for 7 days. Headache was described as

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severe, throbbing, and located in the right parieto-occipital area and radiating to the entire head. The headache was not relieved with 1,200 mg/day of ibuprofen. It was associated with dizziness and difficulty in ambulation but no changes in vision. The patient did not report any similar symptoms in the past. He attributed his headache to possible sinusitis and therefore did not seek immediate medical attention. He had an intentional weight loss of 25 pounds in 1 year that he attributed to intense workouts in prison, where he had been incarcerated for 1.5 years. He was on no medications at home.

On exam, the patient's pulse rate ranged from 55 to 64 beats per minute; his blood pressure was normal; and his visual fields were full to confrontation. His labs revealed a failed pituitary-thyroid, pituitary-adrenal, and pituitary-gonadal axis and low prolactin levels (Table 1). ANCAs were negative. Electrolytes were normal, and there was no evidence of diabetes insipidus.

Computed tomography imaging revealed enlargement of the sella turcica with partial erosions of the dorsum and floor and mild suprasellar and parasellar extension into the cavernous sinus regions, which was confirmed with magnetic resonance imaging of the brain, which showed a large complex 2 × 2.2 cm sellar mass with hemorrhagic components (Figs. 1 through 3).

The patient received hydrocortisone 100 mg intravenously every 8 hours for 3 days, followed by 30 mg of hydrocortisone daily. He was also started on levothyroxine (75 μg once daily). With normal visual acuity and visual fields, surgical decompression was deferred. He was discharged on hydrocortisone 20 mg in the morning 10 mg in evening and 75 μg of levothyroxine once daily, with instructions to follow-up in our endocrinology clinic in 1 week. The patient has since been lost to follow-up.

DISCUSSION

We herein report a case of panhypopituitarism resulting from a sellar mass (most likely a pituitary macroadenoma) and pituitary apoplexy induced by a single intranasal cocaine use. A clear onset of headache immediately following cocaine use lasting for 1 week resulting in pituitary apoplexy is strongly supportive of the diagnosis. Cocaine is a potent vasoconstrictor; it blocks the presynaptic re-uptake of norepinephrine and dopamine and thereby stimulates the postsynaptic receptor to produce a potent sympathomimetic effect (7). Cocaine also enhances endothelin levels and reduces nitric oxide levels, which in turn promotes vasoconstriction (8,9). In addition to causing vasoconstriction, cocaine enhances platelet aggregation and thrombus formation (10). Although the association of cocaine use with myocardial infarction (7,11) and stroke (12,13) due to the above-mentioned mechanism has been well described; pituitary apoplexy and panhypopituitarism resulting from similar mechanisms need special mention. Although it is arguable that a pre-existing macroadenoma

Table 1
Laboratory Results

Lab	Result	Normal value
AM ACTH	<1.1 pg/mL	7.2-63.3 pg/mL
AM cortisol	<0.8 μg/dL	4-20 μg/dL
30-min post-cosyntropin	9.5 μg/dL	
1-hour post-cosyntropin	11.2 μg/dL	
LH	0.3 mU/mL	1-8 mU/mL
Testosterone	<20 ng/dL	300-1,200 ng/dL
Prolactin	1 ng/mL	0-17 ng/mL
SHBG	40.2 nmol/L	19.3-76.4 nmol/L
Free T_4	0.61 ng/dL	0.8-1.8 ng/dL
Total T_3	59 ng/dL	75-165 ng/dL
TSH	0.196 μU/mL	0.4-5 μU/mL
IGF-1	69 ng/mL	56-201 ng/mL
ANCA	<1:16	

Abbreviations: ACTH = adrenocorticotropic hormone; ANCA = anti-neutrophil cytoplasmic antibody; IGF-1 = insulin-like growth factor 1; LH = luteinizing hormone; SHBG = sex hormone–binding globulin; T_3 = triiodothyronine; T_4 = thyroxine; TSH = thyroid-stimulating hormone.

has a tendency to hemorrhage on its own, acute cocaine use in our case likely triggered the pituitary hemorrhage within the macroadenoma, probably through severe vasoconstriction of the hypophyseal vessels. As our patient did have a weight loss of 25 pounds in the previous year and a pituitary macroadenoma, it is also possible that he had preexisting pituitary hypofunction; however, this is unlikely as weight loss was intentional and there were no symptoms or signs suggestive of panhypopituitarism on presentation. Panhypopituitarism associated with chronic cocaine use is rare, with only 2 cases reported in the literature to date (5,6). Lange et al (5) reported a 41-year-old man with a history of intranasal cocaine abuse for 6 years, who had panhypopituitarism and a largely destroyed nasal cavity, accompanied by the presence of HNE-specific ANCAs. Cocaine use can mimic the nasal abnormalities and serology results found in autoimmune vasculitides, such as Wegner's granulomatosis (WG), which is characterized by granulomatous inflammation in the upper and lower airways, vasculitis, and necrotizing glomerulonephritis (14). ANCAs target neutrophil antigens such as proteinase-3 (PR-3), myeloperoxidase (MPO), or HNE and are associated with several vasculitides (15). Ninety percent of WG patients have positive ANCA titers, of which 80% are PR-3 specific, with the remaining 10% of WG patients having MPO-specific ANCAs. By contrast, HNE-specific ANCAs are found in 84% of cocaine-induced midline destructive lesions (CIMDLs) and are solely associated with intranasal cocaine use and not with autoimmune vasculitis. In our case, the patient had snorted cocaine only once after a gap of 18 months; there were no CIMDLs and ANCAs were negative. In the second reported case (6), chronic cocaine use for 8 years resulted in CIMDLs and pituitary infarction (ischemic necrosis). This was believed to be due to direct damage occurring due to repeated local vasoconstriction and pituitary ischemia. In our case, there were no CIMDLs, but vasoconstriction of the hypophyseal vessels resulted in

Fig. 1. Precontrast T1-weighted sagittal image of the brain showing a large complex mass in the sella with heterogeneous hyperintensity on T1, suggesting hemorrhagic components in the mass, as indicated with arrows.

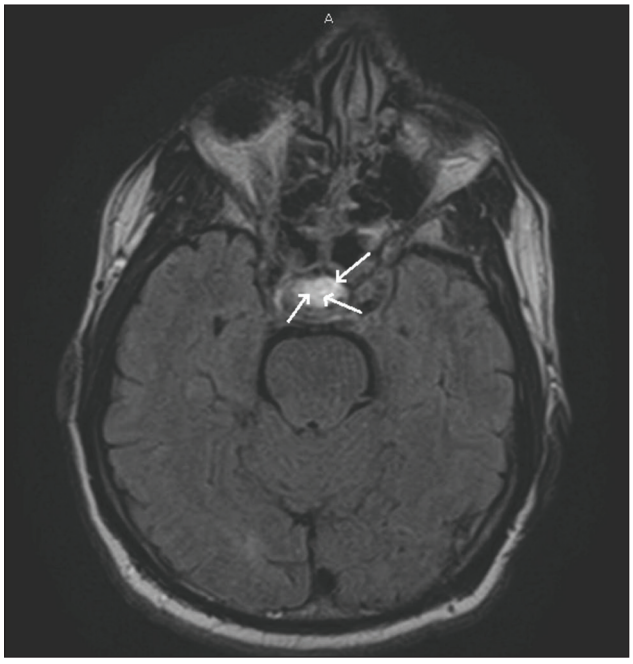

Fig. 2. Axial fluid-attenuated inversion recovery image of the brain showing a large complex sellar mass with heterogeneous hyperintensity suggesting hemorrhage, as indicated with arrows.

Fig. 3. Coronal T2-weighted image of the brain showing a large complex sellar mass with heterogeneous hyperintensity suggesting hemorrhage, as indicated with arrows.

pituitary apoplexy within a pre-existing macroadenoma, as evidenced by intense headache.

CONCLUSION

We suggest that the diagnosis of cocaine–induced pituitary apoplexy should be considered in subjects presenting with severe headaches after cocaine inhalation. We also conclude that cocaine-induced vasoconstriction is another mechanism for pituitary apoplexy and panhypopituitarism in subjects using cocaine.

DISCLOSURE

The authors have no multiplicity of interest to disclose.

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