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Presentación de caso

Psychosis following Acute Adrenal Insufficiency

Psicosis tras insuficiencia adrenal aguda

Zeinab Jalambadani[1]

Ali Taj[2]

Mohammad Reza Shegarf Nakhaie [3]

[1] Non-Communicable Diseases Research Center, Faculty of Medicine, Sabzevar University of Medical Sciences, Sabzevar, Iran

[2] School of Paramedicine, Non-Communicable Diseases Research Center, Sabzevar University of Medical Sciences, Sabzevar, Iran

[3] Sabzevar University of Medical Sciences, Sabzevar, Iran

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Abstract

Introduction: Psychiatric symptoms rarely emerge as primary signs and, particularly, as the sole signs of adrenal insufficiency. Instead, they are associated with chronic medical causes or as a result of medication the patients use. Despite these facts, most physicians, psychiatrists, and endocrinologists are unaware of the relationship between these disorders. In this, we present a patient who had both psychotic symptoms and an adrenal insufficiency diagnosis.

Case presentation: In the present report, we describe a 52-year-old Iranian woman with psychosis following adrenal insufficiency due to an abrupt discontinuation of corticosteroids. She was initially admitted due to loss of appetite, nausea, and vomiting with normal vital signs. The patient's symptoms were: moon face, dry mucous membranes, Ecchymosis in different regions weak muscular force diarrhea. On the third day of her hospitalization, she was restless and aggressive. After further assessment; the medical team found out that she abruptly withdrew the use of dexamethasone (both oral and injection) and thereafter an acute adrenal insufficiency diagnosis was confirmed for her. Also, it was understood that the psychotic symptoms also emerged due to the abrupt discontinuation of Glucocorticoids.

Conclusions: The abrupt discontinuation of Glucocorticoids in patients can lead to acute adrenal insufficiency, demonstrating symptoms like edema, moon face, dry mucous membranes, and gastrointestinal symptoms. But it also can be seen alongside with psychotic symptoms which is a side-effect of abrupt discontinuation of Glucocorticoids.

Key Words: psychosis, adrenal insufficiency, nursing, internal medicine

Resumen

Introducción: los síntomas psiquiátricos rara vez se presentan como signos primarios y, en particular, como los únicos signos de insuficiencia suprarrenal. Más bien, están asociados con causas médicas crónicas o como resultado de la medicación que los pacientes utilizan. A pesar de estos hechos, la mayoría de los médicos, psiquiatras y endocrinólogos desconocen la relación entre estos trastornos. En este informe, presentamos un paciente que presentó tanto síntomas psicóticos como diagnóstico de insuficiencia suprarrenal.

Presentación caso: en el presente informe, describimos a una mujer iraní de 52 años con psicosis tras insuficiencia suprarrenal debido a una interrupción abrupta de corticosteroides. Inicialmente fue ingresada por pérdida de apetito, náuseas y

vómitos con signos vitales normales. Los síntomas de la paciente fueron: cara de luna, mucosas secas, equimosis en diferentes regiones, debilidad muscular y diarrea. En el tercer día de hospitalización, estuvo inquieta y agresiva. Tras una evaluación más profunda, el equipo médico descubrió que había interrumpido abruptamente el uso de dexametasona (tanto oral como inyectable) y posteriormente se confirmó el diagnóstico de insuficiencia suprarrenal aguda. Además, se entendió que los síntomas psicóticos también surgieron debido a la interrupción abrupta de glucocorticoides.
Conclusiones: la interrupción abrupta de glucocorticoides en pacientes puede llevar a insuficiencia suprarrenal aguda, manifestándose con síntomas como edema, cara de luna, mucosas secas y síntomas gastrointestinales. Sin embargo, también puede presentarse junto a síntomas psicóticos, los cuales son un efecto secundario de la discontinuación abrupta de glucocorticoides.
Palabras clave: psicosis, insuficiencia suprarrenal, enfermería, medicina interna

Introducción

Psychiatric symptoms rarely emerge as primary signs and, particularly, as the sole signs of adrenal insufficiency. Instead, they are associated with major symptoms in most cases; and the emergence of psychiatric symptoms expresses the severity of the disease. Despite these facts, most physicians, psychiatrists, and endocrinologists are unaware of the relationship between these disorders, and the most frequent error in diagnosing adrenal insufficiency occurs when the presentation of the disease reflects both psychiatric and digestive symptoms. On the other hand, the prevalence of self-medication with corticosteroids is high in some regions, where its abrupt withdrawal may lead to acute adrenal insufficiency and the emergence of psychiatric symptoms, which are associated with delayed diagnosis and less noted. In the present report, we describe a case of psychosis caused by adrenal insufficiency following sudden discontinuation of corticosteroids. In this, we present a patient who had both psychotic symptoms and an adrenal insufficiency diagnosis.

Case presentation

The patient was a 52-year-old Iranian woman admitted for loss of appetite, nausea, and vomiting, and was hospitalized in the internal service for not responding to outpatient therapies. Upon admission, the vital signs appeared as follows:

- Blood Pressure: 130/50 mmHg
- pulse rate: 85 per minute

- respiration rate: 16 per minute
- body temperature: 36.5 ℃

Upon physical examination, moon face, dry mucous membranes, and Ecchymosis in different regions were detected. The patient's muscular force was 3/5, and she gradually lost her motion. The patient got diarrhea and was unable to control stool (feces).

On the third day of her hospitalization, she was restless and aggressive and did not sleep overnight.

She removed her urine and Intravenous catheters and was unable to tolerate being bedridden. She imagined an explosive mine under her bed, which she perceived, to explode soon. A history of hypertension and diabetes was also reported. The results of laboratory tests were as follows: white blood cell count =5900, red blood cell count =5.46, hemoglobin =126 g/L, hematocrit =41.6, Na^+=133, K^+=4.3, and creatinine =0.4 mg/dL.

Psychiatric consultation was requested, where persecutory delusion was confirmed but hallucination was not found. Orientation with time, place, and individuals was normal.

After frequent follow-ups and telephone calls, one of her relatives finally agreed to be interviewed in the hospital. The relative denied a history of serious psychiatric disorders in the patient but revealed that she had long been dependent on dexamethasone (both oral and injection) which she abruptly withdrew two weeks ago by the recommendation of some other relatives.

Therefore, an immediate diagnosis of acute adrenal insufficiency due to abrupt withdrawal of corticosteroid was made, and treatment started with prednisolone 10 mg b.i.d. Nausea and vomiting stopped after the first two doses. The patient relaxed, then psychotic symptoms relieved on the second day, and she was discharged from the hospital for gradual withdrawal of the medicine.

Discussion

One of the relatively uncommon complications related to adrenal glands (a pair of glands placed above the kidneys) is adrenal insufficiency which comes in three forms (primary, secondary, and tertiary) with distinct pathologies and treatment follow-ups [1, 2] The unspecific symptoms behind adrenal insufficiency often lead to challenges in the diagnosing process.[3]

In a study by Bleicken et al., out of 216 patients with primary or secondary adrenal insufficiency, less than 30 % of women and less than 50 % of men were diagnosed during

the first six months after the emergence of symptoms; 20% of them suffered from the symptoms five years before the diagnosis; more than 67 % of them had already consulted with at least 3 physicians, and 68 % were misdiagnosed.[4]

The cardinal symptoms of this disease include fatigue, lethargy, lack of appetite, nausea, vomiting, constipation, abdominal pain, myalgia, arthralgia, flexion contracture in rare cases, maxillary and pubis hair thinning, salt craving, orthostatic hypotension, and hyperpigmentation of the skin (in the primary adrenal insufficiency).[5-7]

The psychiatric symptoms of Addison's disease (primary adrenal insufficiency) were characterized for the first time in 1899 by Kipple, and were recognized as Addisonian encephalopathy; however, the relationship is still not given due attention.[4, 8] Anglin et al. published four case reports in the 1940s and 1950s and found a 64 % to 85 % prevalence rate of neuropsychiatric symptoms in patients with adrenal insufficiency. Similarly, Iwata et al. expressed that neuropsychiatric symptoms were likely to emerge as the first symptoms of adrenal insufficiency.[9]

Neuropsychiatric symptoms include (depression, irritability, sleep disorders, apathy, cognitive damage, delusion, and hallucination). Also, symptoms such as confusion, confabulation, irrelevant talk, and slow thinking (reduced processing speed) are reported in acute adrenal insufficiency.[10]

Depression is the most common symptom associated with adrenal insufficiency and emerges together with mild mood symptoms, demotivation, and behavior changes. However, psychosis, mania, delirium, catatonia, and disorders of memory and orientation are less noticeable. Psychosis is mainly seen with Addisonian crisis and the severe type of the disease. [4, 7]

Addisonian crisis is a life-threatening condition and a severe medical emergency by itself; such patients suffer from severe hypotension, hyponatremia, fever, psychosis, delirium, and even coma. Other symptoms such as agitation, delirium as well as audio-visual hallucinations are reported in ome patients with adrenal insufficiency crisis.[9] Altogether, psychotic symptoms are reported from 4 % to 8 % in case series.[7]

Laboratory tests revealed electrolyte disorders such as hyponatremia due to inappropriate ADH secretion (which occurs because of decreased glucocorticoid), hyperkalemia, mild hypercalcemia, hyperchloremia, and metabolic acidosis, azotemia, mild normocytic anemia, lymphocytosis, and mild eosinophilia; also, hypoglycemia occurs after long starvation.[7]

Causes of adrenal insufficiency are numerous, including autoimmune diseases and infectious diseases such as tuberculosis.[7, 9] Corticosteroids are highly protein-bound hormones produced by adrenal glands. The formulations of corticosteroids are accessible in diverse forms, including oral, intravenous, intramuscular, aerosol, intra-articular, and topical.[11] Furthermore, they are prescribed for various medical conditions (acute and chronic) and illnesses in different doses.[11, 12] As for side effects, corticosteroids could cause adrenal insufficiency and psychiatric behaviors such as insomnia, mood swings, paranoia, depression, depersonalization, and psychosis (in severe cases).[11-13]

The risk of adrenal insufficiency is present in all patients who take corticosteroids [14]. Gradual reduction of doses prescribed over time can release the inhibition on the hypothalamic-pituitary-adrenal (HPA) axis so that they can gain back their function,[11] Abrupt withdrawal of corticosteroids, hemorrhage, and adrenal infarcts can also lead to acute Addison's syndrome .([7, 9]

The global prevalence rate of self-medication ranges from 0.2 to 3 %. In Iran, medications taken without prescription amount to 10 to 15 %, and self-medication with steroids is not an exception. From 2005 to 2010, medication with corticosteroids has risen from 13% to 23 % in Iran. In addition to their side effects, their abrupt withdrawal is associated with complications such as acute adrenal insufficiency which is likely to lead to serious symptoms in patients [6].

The causes of psychiatric symptoms behind adrenal insufficiency are unknown, but some probabilities are noted, such as hyponatremia leading to brain swelling and lowered consciousness, memory loss, and slow thinking. In addition, glucocorticoid receptors are located in the brain, particularly in the hippocampus. The consequences of lowered stimulation of these receptors are associated with memory impairment, and frontal circuit dysfunction, problems in executive function, speed of brain processes, reasoning, and thinking. Proopiomelanocortin, on the other hand, is a frontal hypophysis hormone that is abundantly produced if glucocorticoid stimulation is reduced; this leads to a rise in endorphin production which causes psychotic symptoms and hallucinations [4].

Henkin believed that glucocorticoid reduction led to neural irritability and increased capacity to receive sensory stimuli and, in turn, led to auditory hallucination [9]. In most cases, physical and psychiatric symptoms fade away in less than a week after corticosteroid treatment [7]. In our patient, symptoms all faded away two days after the treatment onset. Psychiatrists need to consider medical causes such as adrenal insufficiency in the face of patients with acute psychosis with no prior history of psychiatric disorders, and pay special attention to medication history, particularly in regions where taking glucocorticoids is common for cultural reasons, e.g., for weight gain.

Conclusions

The abrupt discontinuation of glucocorticoids in patients can lead to acute adrenal insufficiency, demonstrating symptoms like edema, moon face, dry mucous membranes, and gastrointestinal symptoms. But it also can be seen alongside with psychotic symptoms which is a side-effect of abrupt discontinuation of glucocorticoids.

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Conflict of interest

I declare that I have no conflicts of interest in the publication of this article.

Authors Contribution Statement

M.Sh. presented the information related to the case. A.T. and Z.J. drafted the manuscript. All authors revised and re-checked the manuscript.