Unusual presentation of more common disease/injury

Hypoadrenalism presenting as a range of mental disorders

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Summary

This case report describes interaction of trauma, endocrine disorder and infection resulting in a complex psychopathology in an 82-year-old, previously healthy lady.

One month after a hip replacement, she developed fluctuating cognitive impairment and delusions, associated with hyponatraemia.

Shortly afterwards, development of severe depression resulted in a prolonged psychiatric admission. During this time, she suffered recurring urinary tract infections (UTIs). Delusions and fluctuating cognition persisted. Persistent hyponatraemia prompted regular cortisol monitoring. Gradual decline was detected and primary adrenal insufficiency was confirmed with Synacthen test.

Starting life-long substitution treatment resulted in a normalisation of serum sodium levels, mood and cognition and disappearance of psychotic features.

According to our hypothesis, psychopathology was induced by hypoadrenalism triggered by the hip replacement and perpetuated by recurrent UTIs.

Although delirium-type symptoms are well known to be associated with hyponatraemia, affective disorders have been only described in one previous case report.

BACKGROUND

Common medical disorders and surgical interventions cause increased cortisol demand, which in patients with subclinical hypoadrenalism may precipitate adrenal crisis¹ (Addisonian crisis).

Although it can be treated easily, hypoadrenalism is notoriously difficult to diagnose as it can mimic many other illnesses.

Hypoadrenalism directly^{2–4} and indirectly through hyponatraemia^{5–6} could contribute to the development of delirium and delusional ideas. Although depression is known manifestation of hypoadrenalism,^{2–4} the association between depression and hyponatraemia has only been described in one case report.⁷ We describe in this case report how hyponatraemia on its own and the intermittently manifested hypocortisolaemia can lead to a range of mental disturbances.

CASE PRESENTATION

Mrs A is an 82-year-old single lady, who prior to sustaining a hip fracture, lived independently with no previous or family psychiatric history. She gave her full informed written consent to this report being published.

Her first presentation to Older Adult Mental Health Service was a month after a hip fracture and replacement operation in June 2006. Her presenting problems were a fluctuating level of confusion and persistent delusional ideas that she had developed cancer, that she had sex change against her will and that she recently gave birth to a baby. Her Mini Mental State Examination (MMSE) was fluctuating between 21 and 26 out of 30. Physical examination was unremarkable with stable blood pressure

with no orthostatic hypotension and normal heart rate. Investigations at that stage showed hyponatraemia (Na^+ 124 mmol/l) with normal potassium and mild renal impairment. CT brain revealed age-related mild cerebral atrophy. With a working diagnosis of delirium she was initially treated for hyponatraemia with fluid restriction on orthopaedic ward. Her psychotic symptoms were treated with low dose Haloperidol. However, as she developed extra-pyramidal side effects (EPSEs), it was switched to Amisulpride.

In October 2006, following worsening of her symptoms, she was transferred to functional mental illness ward for elderly. Mental state examination revealed persecutory delusional beliefs that doctors had intention to change her sex against her will and that other patients were plotting to murder her. She also showed low mood with labile affect and anxiety. Her sleep and appetite were affected and she lost weight. Her concentration and motivation were impaired. Investigations at this point revealed normal electrolytes, glucose, liver function tests, thyroid function tests, inflammatory markers and random cortisol. Her blood pressure, heart rate and electrocardiogram were within the normal range. She was started on Sertraline for depressive symptoms and continued Amisulpride.

Over next 5 months her mental state remained fluctuating and she had five episodes of urinary tract infections (UTIs). Infections were treated until sterile urine was obtained. Inflammatory markers and electrolytes were carefully monitored. Because of the re-emergence of EPSEs, Amisulpride was replaced with Aripiprazole. However, Mrs A could not tolerate a daily dose of more than 2.5 mg.

Figure 1 Graph representing time line of symptoms and biochemical markers. Blue rectangle signifies the presence of psychiatric symptoms.

Figure 2 MRI showing pituitary adenoma (white arrow).

INVESTIGATIONS

Microbiologically confirmed UTI re-infections were investigated using flexible cystoscopy, which showed no abnormalities.

As hyponatraemia persisted, morning cortisol was re-tested on several occasions, which, though in the normal range, revealed downward trend (figure 1). Urine sodium and serum osmolality analysis ruled out syndrome of inappropriate anti-diuretic hormone secretion.

CT and MRI (figure 2) brain revealed a non-invasive pituitary macro-adenoma. Endocrine tests showed a non-secreting tumour and due to local compression, there was mild hypopituitarism with low luteinising hormone, follicle-stimulating hormone and growth hormone. Neurosurgical review confirmed an indolent tumour and conservative treatment was advised.

As a full battery of endocrine investigations, synthetic adrenocorticotrophic hormone stimulation test identified primary adrenal insufficiency.

DIFFERENTIAL DIAGNOSIS

The fluctuations in her cognition, persistent psychotic symptoms and her inability to tolerate even a small dose of atypical antipsychotic drugs raised the possibility of Dementia with Lewy Bodies. However, this differential was ruled out by Ioflupane (^{123}I) SPECT Scan (DaTSCAN) (figure 3).

TREATMENT

Main intervention was corticosteroid replacement therapy with hydrocortisone. This intervention resulted in

Figure 3 Showing normal DaTSCAN.

a normalisation of her serum sodium levels. Soon, her mental state improved with resolution of depression and psychosis.

OUTCOME AND FOLLOW-UP

Her MMSE score increased to 27/30. After further 6 weeks of physical and occupational therapy, Mrs A was discharged to a residential home.

Mrs A was reviewed both at the Home and in the OP clinic at 4 weeks, 6, 12, 18 and 30 months postdischarge and she remained well in her mental health. The Addenbrooke's Cognitive Examination⁸ score at the 12 months' follow-up was above the cut-off for dementia at 86/100.

DISCUSSION

We discuss the probable pathophysiological mechanisms. It is likely that Mrs A had subclinical primary hypoadrenalism, which decompensated in the postoperative period following hip replacement. Increased cortisol demand with sudden adrenal crisis (Addisonian crisis) is a well-known complication of surgical interventions in patients with hypoadrenalism.¹

Hypoadrenalism directly^{2–4} and indirectly through hyponatraemia^{5–6} could have contributed to the development of delirium and delusional ideas. Subsequent depression could have also been caused directly by hypoadrenalism.^{2–4} However, the association between depression and hyponatraemia is only described in one case report.⁷

Recurrent UTIs continued to decompensate her adrenal function⁹ and psychopathology showed treatment resistance. Once the hypoadrenalism was diagnosed and treated with hydrocortisone, both the hyponatraemia and psychological symptoms resolved.

Pituitary adenoma is an incidental finding and is unlikely to have contributed to her psychopathology as complete resolution occurred even though adenoma persists. Non-functional adenomas not requiring surgery have minimal impact on quality of life.¹⁰ However, if these are invasive, depression is a common feature.^{11–12}

Competing interests None.

Learning points

- Addison's disease is notoriously difficult to diagnose as it can mimic many other illnesses.
- Newly arising psychotic illness in an elderly patient should cause strong suspicion of organic cause
- Hyponatraemia is rare but possible cause of depression
- Common laboratory findings are hyponatraemia (95%), hyperkalaemia in (65%) and hypoglycaemia (50%)¹³
- If promptly treated it has a good prognosis

Patient consent Obtained.

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