

## Aggression and Homicidal Thoughts in a Patient with Primary Hyperparathyroidism: A Case Report

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### Abstract

**Introduction:** Aggression in various forms may be one of the components of emotional/behavioural problems seen in a Child and Adolescent Mental Health Service. Aggressive symptoms may result from a psychiatric condition or a physical illness such as Primary Hyperparathyroidism.

**Case Presentation:** The authors present a case of worsening psychiatric symptoms in a patient who was serendipitously diagnosed with Primary Hyperparathyroidism. His aggressive outbursts, suicidal and homicidal thoughts remitted following parathyroidectomy.

**Conclusion:** Primary Hyperparathyroidism should be considered in the differential diagnosis in young people with worsening neuropsychiatric symptoms which are unresponsive to standard psychiatric treatment. Child Psychiatrists should always take holistic approach when managing patients and should be familiar with medical conditions that present with psychiatric symptoms.

**Keywords:** Key words: Aggression, primary hyperparathyroidism.

**Abbreviations:** Abbreviations: PHPT – primary hyperparathyroidism; CAMHS – Child and Adolescent Mental Health Service; GP – General Practitioner; FBC – Full Blood Count; LFT – Liver Function Test; U&E – Urea and Electrolytes; TFT – Thyroid Function Test.

### Introduction:

We report a case of worsening psychiatric symptoms in a patient who was serendipitously diagnosed with Primary Hyperparathyroidism.

Behavioural change in form of aggression sometimes occurs as a component of psychiatric disorders such as psychosis, attention deficit hyperactivity disorder, autistic spectrum condition, conduct disorder and various mood disorders. It may also present as a psychiatric manifestation of an endocrine disorder such as Primary Hyperparathyroidism (PHPT)<sup>1,2</sup>.

PHPT is rare in children and adolescents with an incidence of 2-5 in 100000<sup>3</sup>. It is characterized by hypercalcaemia and elevation of parathyroid hormone. Children with PHPT may present with non-specific complaints such as behavioural change and deteriorating school performance.

Patients who present with non-renal symptoms have a longer duration of symptoms prior to diagnosis of PHPT<sup>4,6</sup>. It seems probable that it takes much longer for diagnosis to be made in those with pre-existing mental disorder. When left undiagnosed and untreated, PHPT can be a serious disease with significant morbidity.

The finding of elevated serum calcium levels in young people is often fortuitous as they often present with non-specific symptoms<sup>3,4</sup>. A significant number of hyperparathyroidism cases with neuropsychiatric manifestation have been reported in patients without recorded pre-existing psychiatric diagnosis<sup>3-6</sup>.

This case report highlights the need for clinicians to always consider endocrine disorder as a differential diagnosis when treating patients with psychiatric symptoms which are poorly responsive to standard treatment. It also demonstrates the relevance of an integrated approach in healthcare delivery including the importance of good communication between primary and tertiary care clinicians.

### Case Report:

A 15yr old Caucasian male known to Child & Adolescent Mental Health Service (CAMHS) for management of his behavioural problems presented in crisis as a consequence of physical aggression, suicidal ideation and homicidal thoughts.

His first contact with CAMHS had been at the age of 10 when he was referred for management of his frequent aggressive outbursts. He had always been boisterous but had no previous history of significant emotional or behavioural difficulties. His developmental history was unremarkable and there were no features indicative of any neurodevelopmental disorder. There was no family history of mental illness.

His biological parents were involved in an acrimonious divorce at the time of his first referral to CAMHS so it was felt that this conflict may have contributed to his presentation.

He was referred a Child Psychotherapist for weekly sessions as the initial assessment suggested significant weakness in his attachment and identification which manifested in the instability and immaturity of mood and behaviour.

The family described minimal improvements in his capacity for self-control having had three years of psychotherapy. His behaviour remained challenging but manageable within the community until six months prior to him being re-referred by his General Practitioner (GP) for urgent psychiatric assessment.

Following parental divorce, his mum remarried but her new marriage was also turbulent and the couple had to separate. During this period of increased psychosocial stresses within his family, the patient's behaviour escalated to a point that he was regarded as a significant risk to himself and others. It was thought that the separation between his mother and step-father might have triggered this deterioration.

The night before his urgent referral to CAMHS, he set a trap for his mother; he had put a rope around some curtains on the floor and was planning to throw another curtain over her. He also had a knife and hockey stick with him at the time. As his mother stepped into the room, he put the curtain over her head and attempted to hit her with the hockey stick. He was promptly restrained by his father, who had come to visit, before he could do much damage.

He presented as unpredictable and aggressive but would often deny recollection of any reported outbursts. He was very upset when incidents were talked about as he believed he had no control whatsoever over this behaviour – it was clear how upsetting his behaviour was to *him*.

He displayed uncontrollable rage on many occasions. It was usually directed at his mother and home furniture, and might last up to two hours. He appeared to seek immediate gratification and was clearly hypersensitive to his setting with a significant degree of paranoia and irritability.

He repeatedly stated that he had thoughts of wanting to kill his mother and himself especially when angry. He did not appear able to accept any responsibility for his actions, blaming his temper outbursts on his older sibling. We heard she was extremely frightened of him; he had on two occasions broken down her door.

When he came out of these rages he would become very tearful and profoundly apologetic. These difficulties had been noticed at school where his grades had been falling. He told teachers he felt suicidal and would sometimes go into the school toilet to cry especially when he thought about his inability to control himself.

Physical examination at this point was unremarkable. The Community Psychiatrist commenced him on Fluoxetine and referred him to an in-patient psychiatric unit for further psychiatric evaluation including a forensic assessment.

He was diagnosed with Asperger's Syndrome and Attention Deficit Hyperactivity Disorder in the inpatient unit and was prescribed risperidone and methylphenidate. His GP was asked

to arrange a baseline blood test, consisting of full blood count (FBC), liver function test (LFT), urea & electrolytes (U&E) and thyroid function test (TFT). There was no request for blood glucose level or serum calcium.

The GP asked for a serum calcium level estimate purely out of 'habit'. The laboratory result showed a high level of calcium 3.89mmol/L (normal range 2.2-2.6). Based on this significantly elevated serum calcium level, a referral was sent to the Paediatric Endocrinologist.

At the Endocrinology Clinic, he described a twelve month history of generalised aches and pains in association with emotional lability. A history of fracture of his right wrist and left hallux occurring within 18 months prior to presentation was also obtained. The X-ray report showed presence of a radiolucent area in his right femur. An assay of his parathyroid hormone, Sestamibi scan and ultrasound scan of his neck were done.

The elevated parathyroid hormone level, increased serum calcium, history of fractures and X-ray features indicated the diagnosis of Primary Hyperparathyroidism. The endocrinologist was of the opinion that his PHPT has been present for a number of years. He was referred for parathyroidectomy.

His serum calcium level dropped to 2.47mmol/L two days post-surgery. As calcium level normalised, his symptoms improved remarkably and his psychotropic medications were discontinued. Since then, he has successfully commenced college full time and has succeeded in obtaining good grades in his chosen courses.

#### Discussion:

Psychiatric symptoms cause significant impairment in children and adolescents. Having additional symptoms of hyperparathyroidism would exacerbate the psychiatric symptoms and increase the degree of impairment. This patient presented with neuropsychiatric symptoms and evidence of end organ damage which is similar to those in published reports<sup>3,4</sup>.

Research shows that diagnosis of primary hyperparathyroidism is often delayed in young people but we suspect that it may even be more delayed in those with a pre-existing psychiatric disorder as the symptoms may be more likely to be attributable to the psychiatric condition.

It is possible that the behavioural problems in this patient may have co-existed independently of each other, but the rapid resolution of the psychiatric symptoms suggests that they may have been exacerbated by hyperparathyroidism.

Our findings in this case are similar to those reported by Spivak and colleagues<sup>7</sup> which showed that early diagnosis of hypercalcaemia can prevent unnecessary and potentially harmful treatment with psychotropic medications<sup>7</sup>.

Psychiatric diagnoses are usually formed from identification of collective symptoms some of which may occur in other medical conditions. Adopting a multidisciplinary team approach is most helpful in the management of complex psychiatric cases. This approach may encourage clinicians to take a holistic view in management of children.

It is important for clinicians to be familiar with common psychiatric symptoms and medical conditions that may mimic or cause them because the presence of non-specific symptoms in PHPT poses a significant emotional burden for affected children and their families. It is a potentially treatable condition which if not diagnosed early could lead to impaired psychosocial well-being and damage of vital organs. Parathyroidectomy has been shown to improve general health, quality of life and cognitive functioning in patients with PHPT<sup>8</sup>.

The outcome for this particular young person could have included further episodes of in-patient hospitalisation or involvement with the juvenile justice system as a consequence of further violent episodes. The achievement of adolescent milestones and his education could have been severely disrupted and may have resulted in labelling detrimental to his future.

In the current economic climate and because of the rarity of Primary Hyperparathyroidism, we do not advocate routine serum calcium estimation in all behavioural problems but clinicians should have lower threshold for screening for this condition especially in patients with worsening symptoms despite conventional treatment.

In conclusion, Primary Hyperparathyroidism should be considered in the differential diagnosis in young people with worsening neuropsychiatric symptoms which are unresponsive to standard psychiatric treatment.

#### Competing Interests

None declared

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