

A Rare Presentation of Attention Deficit/Hyperactivity Disorder

A recommendation to be more alert!

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عرض نادر لاضطراب نقص الانتباه/فرط النشاط توصية لاتباه أكبر!

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الملخص: ندرج هنا حالة طفلة عمانية عمرها سبع سنوات تُعاني من التصلب الحدبي واضطراب نقص الانتباه/ فرط النشاط مع اضطراب الهوس في مستشفى جامعة السلطان قابوس. في السنة الأخيرة كانت تُعاني من فرط النشاط والعدوانية والثثرة والأرق والسلوك الخطر ونقص الانتباه وسرعة التشتت ونوبات الصرع. بدأت هذه الأعراض ببطء لكنها كانت تزداد مرور الوقت. في المركز الصحي (قبل مراجعة مستشفى الجامعة) أعطيت لها أربعة أدوية دون إجراء الفحوص الضرورية اللازمة. وقد ساءت حالة الطفلة بعد العلاج. في مستشفى الجامعة كانت تُظهر فرطاً في النشاط مع سلوك متهور وسرور بالغ غير مُبرّر وتطايير الأفكار. والكلام واللعب مع الذات. كما أن ثقتها بنفسها كانت عالية. أظهر الفحص الطبي السريري وجود عدة بقع ناقصة الميلانين في مختلف مناطق الجسم وكذلك وجود لُطَخَة خَرَشَاء في أسفل الظهر. في تخطيط الدماغ كان هناك كهربائية زائدة في مختلف المناطق بينما ظهر في تصوير الدماغ وجود تكلسات في قضيته. بقية الفحوصات كانت طبيعية. أعطيت عقار الفالبرويت ومن ثم الميتايل فينيديت حيث استقرت حالتها. الهدف من إدراج هذه الحالة ليست فقط لأنها حالة مراضة مرافقة نادرة الحصول. بل لتذكير زملائنا الأطباء الشباب بأن يكونوا أكثر يقظة وتمعنا في فحص وعلاج الأطفال الذين يعانون من أعراض عصبية نفسية من أجل الوصول إلى تشخيص وعلاج صحيحين.

مفتاح الكلمات: اضطراب نقص الانتباه/فرط النشاط. التصلب الحدبي. الاضطراب ثنائي القطبية. الأطفال. الهوس. الفحص السريري. الفحوصات. تقرير حالة. عُمان.

ABSTRACT: We report the case of a 7 year-old Omani girl with tuberous sclerosis (TS), attention deficit hyperactivity disorder (ADHD) and bipolar disorder (BD), at Sultan Qaboos University Hospital (SQUH), Oman. For a year she had been suffering from hyperactivity, aggression, over talkativeness, insomnia, risk-taking behaviour, distractibility, poor attention and seizures. This clinical picture evolved slowly, but was progressive in nature. Before the consultation at her local health centre, she was given four drugs without being properly investigated; she continued to deteriorate. In SQUH, she showed hyperactive-impulsive behaviour, elation, flight of ideas, preoccupation with self and high self-confidence. The physical examination revealed multiple hypomelanotic patches all over the body and a shagreen patch at the sacral area. The electroencephalogram showed generalised epileptic discharges, while brain imaging showed multiple parenchymal calcified foci in both cerebral hemispheres. Other investigations were normal. She was given valproate, and then a psychostimulant, methylphenidate, that controlled her state. Our aim in reporting this case is not only because it is unique, given its rare comorbidity (ADHD, TS and BD), but also to remind our junior colleagues to be alert to the possibility of an underlying neuropathology when performing clinical examinations and investigations of children presenting with neuropsychiatric symptoms.

Keywords: Attention deficit hyperactivity disorder; Tuberous sclerosis; Bipolar disorder; Children; Mania; Physical examination; Investigation; Case report; Oman.

ATTENTION DEFICIT HYPERACTIVITY disorder (ADHD) is the most common neuropsychiatric disorder encountered in children and adolescents, whether in the community or in the clinic. It can be mild, moderate or severe. The prevalence rate of ADHD in Oman is 5.1% in schoolgirls and 7.8% in schoolboys, which are comparable to the rates found in other studies.^{1,2,3,4}

Boys are affected more than girls in a ratio of 3–4:1. The three main symptoms of ADHD are: attention problems, hyperactivity and impulsivity, occurring in variable proportions, giving rise to three main subgroups: mainly inattentive (20%), mainly hyperactive-impulsive (12%) and the combined subgroup (68%).^{5,6} In addition, ADHD children have low self-esteem, emotional instability and



Figure 1: Non-contrast computed tomography scan showing the largest parenchymal calcified focus in right frontal subcortical region.

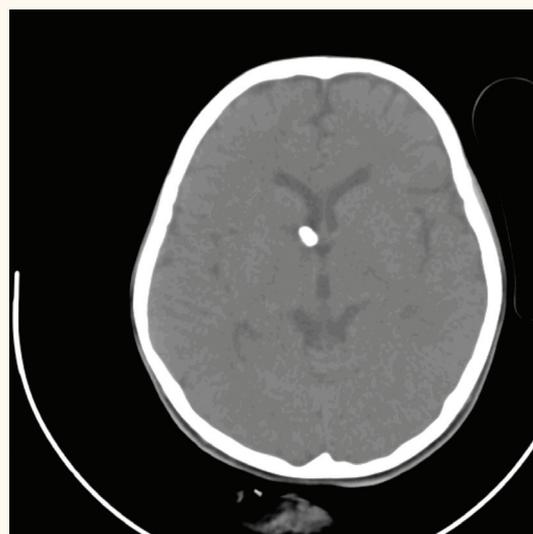


Figure 2: Non-contrast computed tomography scan showing multiple subependymal calcified foci noted in both lateral ventricles.

poor memory. Often the age of onset is 3 years of age; however, symptoms must appear during the first seven years of life, and should persist at least for six months, to fulfill the diagnostic criteria. The disorder may continue even after adolescence in about half of the cases.⁷ Many family studies suggest that genes play a large role in causation, possibly through polygenetic inheritance. Like many other psychiatric illnesses, ADHD probably results from an interaction between both genetic and environmental factors such as: cigarette smoking, alcohol, malnutrition, and infection during pregnancy; hypoxia and brain injuries during labor.^{8,9} Also, exposure to a high level of lead is linked to ADHD.¹⁰ Other rare causes of ADHD are single gene disorders (phenylketonurea, galactosemia), neurofibromatosis, tuberous sclerosis, etc. ADHD is usually associated with comorbid disorders such as: oppositional defiant and conduct disorders, anxiety, depression, autism, mental retardation, sleep disorder, dyslexia and bipolar disorder. ADHD should be differentiated from a long list of other disorders (some of which may be found in association with ADHD) such as: petit mal epilepsy, severe iron deficiency anaemia, hyper- and hypothyroidism, adjustment disorders, child abuse, sleep disorders, drug abuse, lead poisoning, emotional disorders, developmental speech and language disorders, post-traumatic stress disorder, bipolar disorder, and hearing impairment. If not diagnosed and treated early, the consequences of ADHD will be alarming,

not only for the person him/herself, but also for the family and the community. These include: school failure, smoking, drug abuse, alcoholism, road traffic accidents, domestic injuries, family problems, juvenile delinquency, occupational difficulties, etc.^{3,11,12} The treatment of ADHD is multimodal, including special education, psychotherapy and psycho-pharmacotherapy. The prognosis of ADHD depends on many factors including the severity of the condition, early diagnosis and treatment, comorbid conditions (especially mental retardation), and the availability of a supportive environment at school and at home.

Case Report

A 7 year-old Omani girl was referred by a local polyclinic to the Child and Adolescent Psychiatry Clinic at Sultan Qaboos University Hospital (SQUH), Oman. The information giver was the patient's father. The main complaints were: hyperactivity, aggression and insomnia during the previous year. Also, both parents had noticed that, during the same period, the patient had become over talkative (sometimes making irrelevant remarks), distractible with poor attention and concentration, and had exhibited risk-taking behaviour. Her symptoms had started gradually, but were progressive in nature. Because of her aggressive and risk-taking behavior she had stopped going to school. A few months before the consultation, the patient had

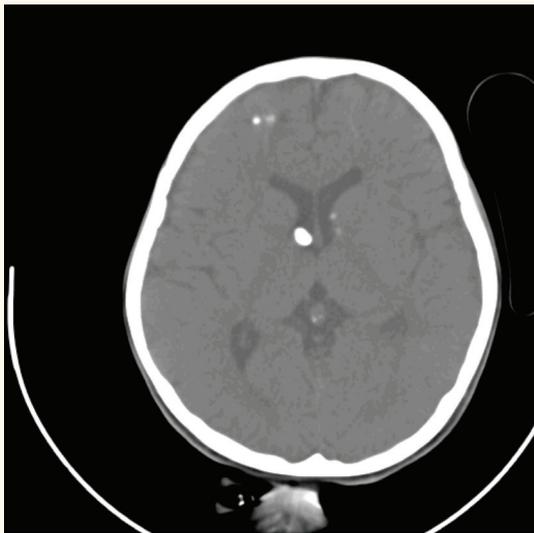


Figure 3: Multiple parenchymal calcified foci in both cerebral hemispheres .

started to have tonic-clonic seizures lasting for about 3 minutes, mostly during the night with uprolling of the eyes, loss of consciousness, frothing in the mouth, and urination. The convulsions had gradually become more frequent (twice a week), occurring both during the day and night. She looked happy, talking and playing with herself most of the time, showing high self confidence. Although the patient had gained bladder control at an early age, she then became incontinent. Her appetite had also diminished. There was no history of fever, head trauma or child abuse. Regarding her sleep pattern, she was going to sleep very late (around 1–2 A.M.) with initial insomnia, sleep interruptions and early waking (at 5–6 A.M.); she did not sleep during the day. Several months previously, her family had taken her to a local polyclinic (psychiatry outpatient department), and without being investigated she was given the following treatment: haloperidol 1.5 mg, procyclidine 5 mg and phenobarbitone 30 mg all three drugs once a day and carbamazepine 100 mg twice daily. The patient did not improve on that treatment, on the contrary, her symptoms worsened over the time. Her medical and psychiatric histories were uneventful. There was no consanguinity between parents, and no family history of mental disorders. She was the last of 7 siblings (from both parents). The pregnancy and delivery were normal; her birth weight was 2.9 kg. Her development was normal. She was described before her illness as a playful, sociable and intelligent girl. The mental state examination showed a well-dressed,

highly hyperactive, impulsive, easily distractible, inattentive, over-familiar child. Her speech was of a high rate and volume with flights of ideas. She maintained eye contact. Her mood looked high with some irritability. She had high self-esteem with evident self-confidence. Her recent memory was disturbed, while her intelligence seemed to be normal. Her weight was 19 kg and height was 113 cm (both at 10th percentile). There were multiple hypomelanotic patches all over the body and a shagreen patch at the sacral area. The physical examination (including neurological) was normal. The computed tomography (CT) and magnetic resonance imaging (MRI) brain scan showed multiple parenchymal calcified foci in both cerebral hemispheres. The largest one was in the right frontal subcortical region and there were multiple subependymal calcified foci noted in both lateral ventricles, which often suggest tuberous sclerosis (TS) [Figures 1, 2 and 3]. The blood investigations were normal. The electroencephalogram (EEG) showed generalised epileptic discharges. She was referred to the neurology section of the Child Health Department for further investigations and for medications to control her seizures. In addition, systemic investigations were done: an echocardiography, a chest X-ray and abdominal ultrasonography, all of which were normal. The fits were controlled with sodium valproate (175 mg twice daily), while the hyperactivity was controlled by methylphenidate (slow release) 20 mg once a day. A diagnosis of tuberous sclerosis, complicated by ADHD and hypomania, was made. A significant change was reported by the parents during follow-up visits in her hyperactivity, inattention and insomnia. She became less talkative, less elated and was seizure-free over follow-up visits.

Discussion

This case represents the commonest neuropsychiatric disorder in child psychiatry, ADHD, which is characterised by disruptive behaviour and disturbed cognitive functions starting in early life. After doing the appropriate clinical assessment and investigations, we found that ADHD was caused by a rare disease, TS. This is a multi-system-genetic disease, resulting in multiple benign tumours affecting different organs, with a prevalence of 1/6,000 newborns. TS is distributed

equally between the two sexes and is caused by mutations of one or two genes: TS1, ch 9 (produces hamartin) and TS2, ch 16 (produces tuberlin). These proteins act as tumour growth suppressors. TS can be transmitted either by autosomal dominance inheritance or by spontaneous mutation. Treatment is directed to control symptoms as there is no cure for TS. The use of adequate doses of valproate controlled the epilepsy in this case, while methylphenidate controlled the hyperactive-impulsive behavior. In addition to the ADHD and TS, this patient showed symptoms and signs of bipolar disorder (mania) as manifested by marked elation, over talkativeness, flight of ideas, high self-confidence and noticeable irritability. Such an association of these conditions is very rare, reported only in two cases in medical literature.^{13,14} Bipolar disorder (BD) in children was previously thought to be an uncommon occurrence, although cases have been diagnosed since the 1970s. It was a matter of debate until few years ago, when psychiatrists start to diagnose and treat such cases with more frequency, possibly due to doctors' increased awareness of the condition.¹⁵ The majority of the BD cases in children (> 90%) is associated with ADHD, while only a minority of ADHD cases (< 20%) suffer from comorbid BD.¹⁶ Early diagnosis and treatment of BD is of high importance to alleviate the devastating outcome of the disorder, which might end in suicide in many cases. In this case, valproate acted as an anti-epileptic and a mood stabiliser while the symptoms of ADHD were treated by methylphenidate.

This case had been treated at the local health centre by active psychotropic drugs without being fully investigated. It is not surprising that the patient did not improve; on the contrary, her state worsened. We emphasise the importance of appropriate physical examination and proper investigations in medical practice, and stress the necessity of excluding organic causes before commencing any treatment.

Conclusion

This case may be the third one in the world presenting with a rare association of TS, ADHD and BD appearing at an early age. We strongly underline the importance of performing a careful clinical examination and proper investigations, which are of crucial importance for sound diagnosis and

treatment.

ACKNOWLEDGMENT

This case was presented on 11th February 2009 in the SQU Clinical-Pathological Conference Series (SCRAPS) as: "Be more reflective!"

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