Clinical Case Rounds in Child and Adolescent Psychiatry:

Certain Eating Disorders May Be a Neuropsychiatric Manifestation of PANDAS: Case Report

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This report describes an eight year old boy with Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococcal infection (PANDAS) related Obsessive Compulsive Disorder (OCD) and Anorexia Nervosa (AN). The OCD symptoms were not confined to the Eating Disorder (ED) and the ED symptoms were not exclusively OCD-based. OCD appears to be well established criteria for PANDAS. This case report suggests that, in some cases, the PANDAS criteria may include Eating Disorders.

The patient is an eight year old boy who presented with a two month history of significant weight loss, behavioural abnormalities, and a history of recurrent culture-proven Group A Beta-Hemolytic Streptococcal (GABHS) pharyngitis. Three months prior to admission (PTA) he had been taught 'healthy eating' at school. He subsequently started reading labels on food packages, avoided all trans-fats, and minimized his fat and simple carbohydrate intake. He was concerned about weight gain and believed that he was 'too fat'. He then began looking at his abdomen and at himself in the mirror numerous times daily. He became suspicious of what his mother might be putting in his food and began only eating packaged foods that he could prepare himself, which amounted to about 200 calories daily. Two months PTA his scheduled tonsillectomy for recurrent GABHS pharyngitis had to be cancelled because the patient had developed pneumonia and pharyngitis. One month PTA and one to two weeks after an episode of pharyngitis, he developed choreoform-like running spurts. He began engaging in ritualistic behaviours, particularly prior to eating, but not exclusively. He would nod his head several times, followed by arm flapping and tapping his mouth before he would take a bite of food. He would raise and lower his hands over his toys to 'undo' what he believed to be contamination. When asked about why he engaged in these behaviours he said, "It helps me to relax" and "It distracts me from the images in my head". He experienced several intrusive images which 'told' him things such as: "you must do the hand thing before you eat or the food will poison you" and "your Mommy is a criminal and contaminating your favourite things". He recognized that these were not real and believed them to come from his imagination. They were so intrusive, however, that he claimed that it prevented him from doing 'just about everything', including eating. His affect was flat and serious and he was very distressed. He had excellent insight and told us that if we could 'help get the images out of (his) head' that he thought he would be 'just fine'. He later developed facial grimacing. He developed numerous rituals such as finger snapping and opening and closing his hands, all behaviours to 'undo contamination'. He developed rules such as having to walk only on his father's right side so as to not 'give off (his) fat cells to people walking by'. He kept detailed notes of what he thought was suspicious behaviour by others on the ward and he set his alarm to awaken each morning at 1:00 am to check. He believed the nurses were 'evil' and thought they might try to poison him or contaminate his things. Past psychiatric history revealed that he had always been an anxious child and worried about break-ins. When he started school he began to get GABHS pharyngitis (confirmed by rapid antigen test or throat culture). In the fall of his first year at school he developed a two month episode of obsessive hand-washing that resolved on its own. He continued to have repeated GABHS infections and

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the following year developed a two month history of obsessive wiping after bowel movements, that also resolved spontaneously. He had a subsequent brief episode of palilalia. A negative throat culture was obtained while the patient was asymptomatic, demonstrating that he was not a GABHS carrier.

His weight dropped 8kg secondary to his food refusal and he was admitted to hospital at 75% ideal body weight with a score of 33 (extremely severe OCD) on CY-BOCS (Children's Yale-Brown Obsessive Compulsive Scale) (Scahill et al., 1997). The patient did not have pharyngitis on admission. In addition, the following were negative: Group A Strep Direct antigen test, throat culture, and blood culture. His blood chemistry was normal. His Anti-Nuclear Antibody and Anti-Streptolysin-O Antibody titres and Rheumatoid Factor were within normal limits. His IgG was low at 4.63. His Anti-DNase B titre was elevated at 1:960 on admission and further elevated to 1:1360 after three weeks. It was our opinion that he had PANDAS and he was diagnosed with OCD and AN.

Treatment included re-feeding via an ED protocol, which included providing replacement calories via nasogastric (NG) tube, if necessary. He began to eat all of his meals, albeit reluctantly, and feeding via NG tube was not necessary. He was initially started on fluvoxamine but became immediately very irritable. He was switched to sertraline and was titrated to 50mg daily, which he tolerated well. He received March's Cognitive Behavioural Therapy (CBT), designed specifically for treating youth with OCD (March and Mulle, 1998), for hourly sessions twice weekly. As this patient presented as severely ill, and each subsequent episode of PANDAS can be increasingly severe, he was put on clarithromycin bid as prophylaxis until he could undergo tonsillectomy. He gained weight weekly over his course in hospital. After three weeks of treatment his CY-BOCS score was 19 (moderate OCD) and all choreoform-like movements had ceased. After five weeks of treatment he was no longer having any OCD thoughts and he was not engaging in any ritualistic behaviours. He had a CY-BOCS score of 1. Once his weight was restored, he underwent tonsillectomy for his recurrent GABHS pharyngitis. He experienced post-operative bleeding, requiring the sertraline to be decreased to 25mg daily for a two week period, as it was hypothesized that sertraline was prolonging bleeding time secondary to the SSRI's effect on platelet serotonin. During this time he had a mild recurrence of OCD symptoms that promptly resolved with resuming his treatment dose of 50mg. He has remained well over the past eleven months.

Discussion

The five diagnostic criteria for PANDAS are based on the clinical features of the first fifty children meeting the criteria for the PANDAS subgroup (Swedo et al., 1998). These criteria include OCD or Tic Disorder (as defined by DSM IV) (American Psychiatric Association, 2000), prepubertal age of onset, an abrupt onset and relapsing or remitting course, neurological abnormalities during exacerbations (such as choreoform movements or motoric hyperactivity), and a temporal association between GABHS infection and neuropsychiatric symptom exacerbations.

The proposed pathophysiology of PANDAS begins with GABHS infecting a susceptible host. An autoimmune reaction occurs, resulting in production of brain tissue specific antistreptococcal antibodies, which triggers an inflammatory response. The autoantibodies react with basal ganglia proteins, particularly in the caudate nucleus and putamen. Obsessions, compulsions, tics and other neuropsychiatric symptoms (possibly including eating disorders as seen in this case report), arise from interaction between these antibodies and neurons in the basal ganglia via an unknown mechanism (Snider and Swedo, 2004). A number of studies provide evidence to support an autoimmune neuropsychiatric disorder hypothesis [(Murphy et al., 2004), (Murphy and Pichichero, 2002), (Giedd et al., 2000), (Perlmutter et al., 1999), (Nicolson et al., 2000)]. However, its validity rests on proving a causal association between a very common childhood illness (5-20% of children are positive for GABHS) and much less common neuropsychiatric symptoms. Nonetheless, the PANDAS hypothesis can be helpful in rare clinical cases where GABHS infection precedes the onset of neuropsychiatric symptoms such as obsessions, compulsions, and tics. From this case report, we also propose that the PANDAS criteria may include Eating Disorders in some cases.

There are few other case reports of PANDAS with possible ED. Sokol and Gray describe two cases of AN which appear to have been triggered by GABHS infection (Sokol and Gray, 1997). The first case was a 12 year old boy whose AN worsened one month after an untreated severe upper respiratory tract infection (URI). He had a negative throat culture but elevated ASO and anti-DNase-B titers, suggestive of a recent GABHS infection. His AN symptoms were alleviated after antibiotic treatment. The second case was a 16 year old boy with sudden onset of obsessive symptoms and failure to gain weight as he grew taller, occurring after a series of URI's. His obsessions were confined to the ED. Throat culture, ANA and ASO titers were negative. He had an elevated anti-DNase-B titer. He had a history of GABHS-positive throat cultures even after antibiotic treatment of pharyngitis. His symptoms resolved after a few months without treatment.

Henry et al. describe three cases of apparent GABHS-triggered OCD in which fear of eating became the obsession (Henry et al., 1999). In the first case, the child had typical OCD symptoms early in the course of his illness, followed by a fear of fat contamination that lead to more typical AN symptoms. The second case was a 7 year old boy who had an abrupt onset of fear of eating after choking on pizza. A throat culture was positive in the absence of pharyngitis (likely indicating that he was a strep carrier). Antibiotics were not helpful. His OCD progressed to include contamination obsessions and excessive handwashing. His symptoms slowly improved over several months with behavioural therapy. One year later, he had an abrupt exacerbation of OCD symptoms. No throat culture or strep titers were obtained, although his sister had a positive throat culture around that time. The third case was of 6 year old girl who developed a fear her food was being contaminated one week after a GABHS pharyngitis. She was treated with an antibiotic. She was admitted to hospital after 3 weeks of continued food refusal accompanied by compulsive cleaning of her cups, straws and food. She improved with sertraline and behavioural therapy until 1 month later when she had an abrupt exacerbation of her contamination obsession. At this time, she had GABHS pharyngitis, confirmed by positive throat culture. She was treated with antibiotics and her symptoms slowly improved until she had another exacerbation, accompanied by a positive throat culture.

Our case adds valuable clinical insight to what few case reports are already published regarding non-OCD neuropsychiatric manifestations of PANDAS. Our patient had a number of GABHS infections, several of which were followed by abrupt onset of OCD symptoms. His most recent presentation, however, manifested as an abrupt new onset of ED symptoms including concerns regarding simple carbohydrate and fat intake, as well as body image distortion and fear of gaining weight in a very young male patient. A few weeks later, after a further episode of pharyngitis, he developed contamination obsessions and compulsions that were only in part related to the ED, in addition to choreoform movements.

This case illustrates a number of interesting points. It suggests that EDs, in some cases, may be an autoimmune-mediated neuropsychiatric manifestation or clinical sub-type of PANDAS. The patient in our case rapidly recovered from his ED and OCD. Perhaps by considering the proposed pathophysiology of PANDAS and by targeting the management of future GABHS infections, the usual course of EDs and OCD could be altered in patients believed to have an autoimmune etiology. One group suggests that PANDAS is an uncommon, but important indication for tonsillectomy (Heubi and Shott, 2003). They report two cases of PANDAS (one brother with OCD and the other with Tic Disorder) who improved significantly after undergoing adenotonsillectomy. It is rare that we would have the opportunity to target etiology in order to alter the course of a psychiatric illness. The authors would like to note that this is only a preliminary finding, and larger case studies with appropriate controls are needed to include ED in the neuropsychiatric manifestations of PANDAS.

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Commentary on Clinical Case Rounds in Child and Adolescent Psychiatry

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The issue of etiology in eating disorders is a complex one with the need to consider both biological and psychosocial contributors which can - particularly at a young age- have a devastating impact on a child's growth and development. The case reported by Calkin and Carandang demonstrates the complicated, and sometimes symbiotic, relationship that exists between eating disorders and obsessive compulsive disorder (OCD). The case reported is particularly challenging as the patient was prepubertal and male, two subgroups of eating disorder patients who have higher rates of OCD (Peebles et al, 2006). Individuals with eating disorders may present with preoccupations and ritualized behaviours with regards to food or weight loss that resemble obsessions and compulsions. It is possible, as Sokol and colleagues (2002) suggest, that some individuals develop a type of anorexia nervosa (AN) related to PANDAS-associated OCD. However, there is currently insufficient evidence, such as strength of association, to demonstrate a causal relationship between PANDAS and AN. In addition, the clinical implications of this subtype of AN are not yet understood: for example, what would be the clinical indicators for the use of antibiotics and/or IV plasmaphoresis in such patients? We agree with the authors that this fascinating area requires more research before best practice guidelines can be presented to clinicians.

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