

P.A.N.D.A.S.

Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococci
www.pandasnetwork.org

What is PANDAS?

PANDAS is a pediatric autoimmune disorder characterized by the dramatic onset of neuropsychiatric symptoms such as obsessions, compulsions, motor or vocal tics [Swedo1997]. PANDAS is thought to be similar to Sydenham Chorea where there is dramatic symptom exacerbation following a strep infection [Kirvan2006].

Signs and Symptoms:

Children with PANDAS must be initially diagnosed with Obsessive Compulsive disorder or a tic disorder [Swedo2004]. These children may have some of the following symptoms that accompany the OCD or tic disorder [Swedo1998][Moretti2006]:

- *Obsessions (e.g., preoccupation with a fixed idea or an unwanted feeling, often accompanied by symptoms of anxiety)
- *Compulsions (e.g., an irresistible impulse to act, regardless of the rationality of the motivation)
- *Choreiform movements (e.g., milk-maid grip, fine finger playing movements in stressed stance)
- *Emotional lability (e.g., irritability, sudden unexplainable rages, fight or flight behaviors) (66%)
- *Personality changes (54%)
- *Age inappropriate behaviors particularly regressive bedtime fears/rituals (50%)
- *Separation anxiety (46%)
- *Oppositional defiant disorder (40%)
- *Tactile/sensory defensiveness (40%)
- *Hyperactivity, impulsivity, fidgetiness, or inability to focus (40%)
- *Major Depression (36%)
- *Marked deterioration in handwriting or math skills. (26%)
- *Daytime urinary frequency/enuresis (12%)
- *Anorexia (particularly fear of choking, being poisoned, contamination fears, fear of throwing up)

PANDAS/OCD is a clinical diagnosis, often marked by the sudden onset and extreme symptom exacerbations (such as an increase of +18 points on the OCD CY-BOCS score during an exacerbation [Murphy2004]). The abrupt onset and remission after eradication of streptococcal infection separates the child from non-PANDAS OCD [Swedo2004]. Many parents can pinpoint a day or a week when behaviors changed [Çengel-Kültür2009].

When a child has primarily vocal and motor tics, the symptoms may appear to overlap with symptoms of Tourettes Syndrome; however, the children can be differentiated by observing symptom exacerbations over time [Pavone2006]. In PANDAS children, a streptococcal infection precedes symptom exacerbation and once treated, initial exacerbations generally remit. The rapid onset with significant remission is characteristic of PANDAS.

Researchers have described chronic PANDAS [Pavone2006] where the tics and/or obsessive-compulsive disorder have a much more gradual course. These cases are difficult to separate from non-PANDAS tics or OCD. Some researchers have found other immunologic markers (anti-neuronal and anti-basal-ganglia antibodies) that help separate PANDAS and non-PANDAS children [Kirvan2006].

Diagnostic tests:

At this time, there are no commercially available tests for diagnosing PANDAS. There are ongoing research

trials that indicate there are differences in specific antibodies that can be tested in blood serum.

[Kirvan2006]

[Church2006][Martono2007]. These are recent findings and the accuracy, repeatability and specificity of

the results are not known. Additional research funding is needed to repeat the experiments at independent laboratories and confirm the diagnostic effectiveness.

A throat culture for Group A Beta-Hemolytic streptococcus (GABHS) at time of exacerbation onset is recommended to diagnose a pharyngeal streptococcal infection [Swedo2004]. If the culture is negative, a blood test may be able to test for streptococcal exotoxins. Two common blood tests are Anti-Streptolysin O (ASO) and Anti-Deoxyribonuclease B (Anti-DNAse B). While these test can confirm a previous strep infection, it cannot exclude a prior infection or a diagnosis of PANDAS. The test are affected by many factors and in one study over 46% of children did not have a rising ASO titer despite having colonized strep and even adding Anti-DNAse B 31% of children did not show a rise[Shet2003].

For children affected by PANDAS, a GABHS infection is considered to be the triggering event that causes an initial episode. However, as is the case with Sydenham's Chorea, subsequent PANDAS exacerbations may be triggered by recurrent GABHS, or by other bacterial or viral infections (ear infections, sinusitis, pneumonia, meningitis, impetigo) further complicating diagnosis [Swedo1998].

Treatment:

Streptococcal infections are treated with antibiotics.

Cognitive Behavioral Therapy (CBT) has been shown to be effective in some children with PANDAS and to provide families with coping strategies during a PANDAS flare [Storch2006]. Caution is recommended for using SSRI's with PANDAS/OCD as there are reports of higher activation rates in such cases [Murphy2006]. In addition, there is a lack of controlled studies showing safety and efficacy of anti-tic or anti-OCD medications (e.g., SSRI and anti-psychotics) for children in the PANDAS subgroup. Several reports have shown effectiveness of immunomodulating therapy (IVIG and PEX) in combination with longer term prophylactic antibiotics[Perlmutter1999]. In addition, several studies have shown efficacy of longer term prophylactic antibiotics alone [Snider2005]. These treatments are still considered experimental and have several risks. Some physicians will use a prednisone steroid burst for a short period of time to assist in diagnosis of an auto-immune disorder. Immunomodulating therapies are not effective for Tourettes Syndrome or other non-PANDAS OCD cases, again separating the child with PANDAS [Nicolson2000].

Getting Help:

PANDAS was only identified in 1998 and as such is a recent disease [Swedo1998]. Additional research is needed to identify the most effective treatment protocols. Taking copies of recent studies to your doctor may help them diagnose and treat your child. You may need to interview pediatricians, neurologists and immunologists. For referrals to local doctors with experience, one source is a parent's support group at (latitudes.org).

Research:

PANDAS is thought to be caused by the following sequence of events in this order:

- *The production by the immune system of an antibody that can interact with neuronal tissue [Kirvan2006][Kirvan2003]
- *A failure of the immune system to suppress this antibody [Kawikova2007]
- *A breach of the blood brain barrier such that the antibody reaches neuronal tissue [Yaddanapudi2009]

All three areas have active research results and require duplication of experiments to help reach consensus in the research community.

References:

For the list of references, please refer to www.pandasnetwork.org. PANDAS Fact Sheet.