Prevalence of Pediatric Acute-Onset Neuropsychiatric Syndrome in Child and Adolescent Eating Disorders

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Introduction

- When surveying the general population obsessive-compulsive disorder (OCD) has a lifetime prevalence rate of 2.3%, peaking in preadolescence and early adulthood. [1]
- Among this age group another common group of presentations are eating disorders (ED); following obesity and asthma they are the third most common chronic illness in adolescents. [2]
- An estimated 64% of individuals with ED are diagnosed with at least one anxiety disorder, and 41% meet criteria for OCD. [3]
- In the child and adolescent population OCD cases that are acute in nature and are accompanied with sudden onset restricted food intake are highly suggestive of a diagnosis of pediatric acute-onset neuropsychiatric syndrome (PANS). [4]
- When group A streptococcal (GAS) infection precedes OCD symptoms and/or tics the diagnosis may meet criteria for pediatric autoimmune neuropsychiatric disorders associated with streptococcal infection (PANDAS). [4]
- To date the prevalence of PANS/PANDAS has been evaluated in pediatric patients with tic disorder (11% abrupt symptom onset, total sample size=80), children at a movement disorders clinic (1% PANS, total sample size=284), and youth at our outpatient OCD clinic (5% PANS/PANDAS, total sample size=136). [5,6,7]
- To our knowledge, no study has screened an ED population for PANS/PANDAS.

TABLE 1. Proposed Diagnostic Criteria for Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococcal Infections and Pediatric Acute-onset Neuropsychiatric Syndrome

I. Diagnostic criteria for pediatric autoimmune neuropsychiatric disorders associated with streptococcal infection (PANDAS)[a]:
   a. Presence of obsessive-compulsive and/or tics disorder
   b. Pediatric onset symptoms must begin between 3 years – puberty
   c. Abrupt onset of symptoms or dramatic symptom exacerbation with a saw-tooth course
   d. Association with a confirmed streptococcal infection
   e. Association with other neuropsychiatric symptoms (e.g. choreiform movements)

II. Diagnostic criteria for pediatric acute-onset syndrome (PANS[b]:
   a. Abrupt and dramatic onset of OCD symptoms or severe restriction of food intake
   b. Concurrent and sudden onset of at least two of the following symptoms:
      i. Anxiety
      ii. Emotional lability/depression
      iii. Irritability
      iv. Aggression and/or oppositional behaviors
      v. Behavioral (developmental) regression
      vi. Deterioration in school performance
      vii. Sensorimotor abnormalities
      viii. Somatic signs and symptoms[c]
   c. Symptoms cannot be better explained by a known neurological or medical condition[d]

[a] As proposed by Swedo et al. (1998).
[b] As proposed by Swedo et al. (2012).
[c] Such as sleep disturbances, enuresis, or urinary frequency
[d] Such as Sydenham chorea, systemic lupus erythematosus, or Tourette's disorder.
OCD, obsessive-compulsive disorder

Objectives

Two main aims of this investigation are:

- To identify the lifetime prevalence of those meeting strict PANS and/or PANDAS criteria within a pediatric eating disorder cohort.
- To describe additional clinical characteristics of PANS and/or PANDAS groups within a pediatric eating disorder cohort.

Methods

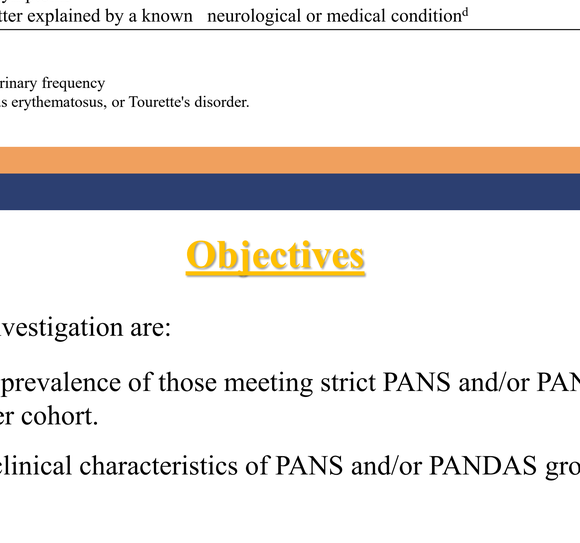

FIG. 1. Sampling methodology used to determine prevalence of PANS and PANDAS in a pediatric ED outpatient clinic.

ED, eating disorder; PANS, pediatric acute-onset neuropsychiatric syndrome; PANDAS, pediatric autoimmune neuropsychiatric disorders associated with streptococcal infections.

Results

TABLE 2. Demographic characteristics, comorbidities, medications and parent reported symptoms for Pediatric Acute-Onset Neuropsychiatric Syndrome subgroup in pediatric eating disorders population.

	PANS group (n= 52)	Non-PANS group (n=48)	P value[a, b]
Demographic characteristics			
Biological sex, number female (%)	46 (88.5)	33 (68.8)	0.016
Symptom onset, mean age (SD)	13.17 (1.96)	12.79 (2.75)	0.131
BMI, mean (SD) [c]	16.44 (2.54)	16.88 (3.22)	0.133
Comorbidities			
MDD (%)	6 (11.5)	2 (4.2)	0.272
Other mood disorder (%) [d]	3 (5.8)	3 (6.3)	1.000
GAD (%)	10 (19.2)	9 (18.8)	0.951
Other anxiety disorder (%) [e]	19 (36.5)	17 (35.4)	0.907
OCD (%)	5 (9.6)	3 (6.3)	0.717
Tic disorder (%)	1 (1.9)	0	1.000
ADHD (%)	5 (9.6)	6 (12.5)	0.645
Autoimmune disorder (%) [f]	2 (3.8)	0	0.496
Other psychiatric disorder (%) [g]	3 (5.8)	6 (12.5)	0.305
Other medical disorder (%) [h]	7 (13.5)	9 (18.8)	0.471
Medications			
SSRI (%) [i]	12 (23.1)	4 (8.3)	0.045
NDRI (%) [j]	1 (1.9)	0	1.000
ADHD medication (%) [k]	0	2 (4.2)	0.228
Antipsychotic (%) [l]	5 (9.6)	2 (4.2)	0.439
Sleep Aid (%) [m]	2 (3.8)	1 (2.1)	1.000
Benzodiazepine (%) [n]	5 (9.6)	2 (4.2)	0.439
Antibiotic (%) [o]	0	1 (2.1)	0.480
Anti-inflammatory/Steroid (%) [p]	1 (1.9)	2 (4.2)	0.606
Parent reported outcomes			
Abrupt onset of either:			
Obsessions or compulsions (%)	39 (75.0)	3 (6.3)	<0.001
Food refusal (%)	46 (88.5)	6 (12.5)	<0.001
Tics (%)	10 (19.2)	3 (6.3)	0.054
Relapsing and remitting course (%)	24 (46.2)	8 (16.7)	0.002
Appears within weeks of strep infection (%)	1 (1.9)	0	1.001
Concurrent and sudden onset of:			
Anxiety (%)	50 (96.2)	9 (18.8)	<0.001
Depression (%)	49 (94.2)	6 (12.5)	<0.001
Irritability or aggression (%)	39 (75.0)	5 (10.4)	<0.001
Behavioural regression (%)	12 (23.1)	0	<0.001
Deterioration in school performance (%)	22 (42.3)	2 (4.2)	<0.001
Abnormal movement/coordination (%)	17 (32.7)	1 (2.1)	<0.001
Sleep problems, enuresis, and/or frequent urination (%)	18 (34.6)	3 (6.3)	0.001

[a] Independent samples t-test, two-tailed was used for continuous measures. Equal variances were assumed, as Levene's Test was not significant in any instance (p>0.05).
[b] Fisher's Exact Test, two-tailed was used for dichotomous measures.
[c] Recorded BMI was missing from two patient charts in the non-PANS group
[d] Including unspecified depressive disorder
[e] Including social anxiety disorder, posttraumatic stress disorder, panic disorder, unspecified anxiety disorder
[f] Including hyperthyroidism, diabetes mellitus, asthma
[g] Including obsessive compulsive personality disorder, specific phobia, dissociative disorder, parent-child relational disorder, bereavement, autism spectrum disorder, somatic symptom disorder, unspecified personality disorder, academic problem-school avoidance
[h] Including iron deficiency, gastroesophageal reflux disease, hypertension, migraines, constipation, osteosarcoma, global developmental delay, learning disorder
[i] Including sertraline, fluoxetine, escitalopram, vortioxetine
[j] Including bupropion
[k] Including guanfacine, methylphenidate (biphentin and concerta)
[l] Including olanzapine, quetiapine, risperidone
[m] Including trazodone, melatonin
[n] Including lorazepam, clonazepam
[o] Including erythromycin
[p] Including cyproheptadine, fluticasone
PANS, pediatric acute-onset neuropsychiatric syndrome; BMI, body mass index; MDD, major depressive disorder; GAD, generalized anxiety disorder; OCD, obsessive compulsive disorder; ADHD, attention deficient hyperactivity disorder; SSRI, selective serotonin reuptake inhibitor; NDRI, norepinephrine dopamine reuptake inhibitor.

Conclusion

- The surprisingly high lifetime PANS rate of 52% within pediatric ED were higher than that previously reported for OCD populations. The large majority had abrupt onset of parent-reported OC symptoms as well as abrupt food restriction.
- Those in the PANS group were more likely to be female, be prescribed an SSRI, and have parent reported abrupt OC symptom onset, abrupt food refusal, relapsing and remitting course, and concurrent anxiety, depression, irritability or aggression, behavioural regression, school deterioration, and sleep problems, enuresis, and/or frequent urination.
- This appears to be a distinct subgroup that requires further characterization with respect to functional impacts and management approaches.

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