

# ADHD Prevalence and Association with Hoarding Behaviors in Childhood-onset OCD

Brooke Sheppard <sup>1</sup>, Denise Chavira PhD <sup>2</sup>, Amin Azzam MD MA <sup>1</sup>, Marco A. Grados MD MPH <sup>3</sup>, Paula Umaña <sup>4</sup>, Helena Garrido MA <sup>4</sup>, Carol Mathews MD <sup>1</sup>

1. University of California, San Francisco, Department of Psychiatry 2. University of California, San Diego 3. Johns Hopkins School of Medicine 4. Hospital Nacional de Niños, San José, Costa Rica

## Background

- OCD and ADHD are both highly comorbid with Tourette syndrome, suggesting that the three disorders are etiologically related. However, the relationship between OCD and ADHD themselves is less well understood. Elucidating this relationship could aid in appropriate diagnosis and treatment as well as advance our understanding of their etiologies.
- 11 studies have reported ADHD prevalence in an OCD-affected sample with rates ranging from 0% to 51%
- Discrepancies probably due to study variation in sample size, age of participants, recruitment sources, and inclusion/exclusion criteria (primarily presence of tic disorders)
- 24.1% pooled prevalence rate of ADHD in OCD in all previous studies (11 studies)
  - 25.7% pooled prevalence rate in studies not excluding tic disorders (9 studies)
  - 9.9% pooled prevalence rate in studies excluding tic disorders (2 studies)
- Hoarding behaviors frequently occur in OCD, 18-40%
- Similar executive functioning problems seen in ADHD may also occur in clinically significant hoarding
- 3 studies have examined prevalence of ADHD symptoms in hoarding, also yielding variable results

## Aims

- To examine prevalence of ADHD and attentional symptoms among individuals with childhood-onset OCD without comorbid tic disorders
- To examine relationship between hoarding behaviors and ADHD and attentional symptoms

## Methods

- 155 OCD-affected individuals recruited for ongoing genetic studies of childhood-onset in the United States (n=132) and Costa Rica (n=23)
- Probands (n=114) recruited through clinician referrals and recruitment tables at annual Obsessive-Compulsive Foundation meetings and relatives (n=41) recruited via probands
- All OCD-affected individuals were included if they did not have a tic disorder
- Hoarding behaviors identified using Y-BOCS questions assessing presence of hoarding obsessions and compulsions as well as detailed semi-structured clinical interview
- Probable ADHD and hoarding diagnoses given when minimum symptom criteria were met, but impairment criteria could not be determined
- All other diagnoses made according to DSM-IV criteria
- Chi square tests (for categorical variables) and t-tests (for continuous variables) used for association analyses
- Generalized estimating equations used to assess association between ADHD and clinical variables of interest

## Results

- 64% female, mean age 37.5 (SD=16.3), range 4-91 years
- Participants had moderately severe OCD with a mean Y-BOCS total severity score of 25 (SD=9); average age at onset = 8.9 years (SD=4.1)
- Probands vs. Relatives:
  - higher Y-BOCS severity scores
  - more depressive disorders
  - more males
- U.S. vs. Costa Rican:
  - higher Y-BOCS severity scores
  - more Substance Abuse/Dependence
  - more females
- ADHD vs. non-ADHD:
- Definite hoarding was the only comorbidity that was significantly associated with ADHD

**Table 1. Psychiatric Comorbidity in ADHD vs. non-ADHD Affected OCD Participants**

|                               | ADHD  | non-ADHD | Full Sample<br><i>X<sup>2</sup> / p</i> | Probands Only<br><i>Fisher's p</i> |
|-------------------------------|-------|----------|---|------------------------------------|
| Probable or Definite Hoarding | 41.9% | 29.2%    | 1.8524 / 0.174                          | 0.092                              |
| Definite Hoarding             | 35.5% | 17.5%    | 4.7708 / 0.029*                         | 0.013*                             |
| Anxiety Disorders             | 45%   | 39.6%    | 0.2013 / 0.654                          | 0.590                              |
| Depressive Disorders          | 69.6% | 67%      | 0.1076 / 0.743                          | 1.000                              |
| Bipolar Disorders             | 4.8%  | 8.6%     | 0.3475 / 0.556                          | 1.000                              |
| Eating Disorders              | 10%   | 13.6%    | 0.1910 / 0.662                          | 0.676                              |
| Substance Abuse/Dependence    | 35%   | 26.4%    | 0.5910 / 0.442                          | 0.567                              |

\**p*<0.05

- Definite hoarding increased the risk for ADHD nearly ten fold when controlling for clinical and demographic variables of interest

**Table 2. Generalized Equations Estimate ADHD in OCD-affected individuals**

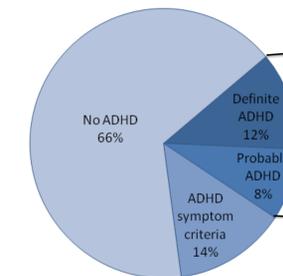
|                      | Odds ratio (95% CI) | SE   | Z     | P    |
|----------------------|---------------------|------|-------|------|
| Gender               | 0.48 (0.16 – 1.47)  | 0.28 | -1.28 | 0.20 |
| Age                  | 0.98 (0.94 – 1.01)  | 0.02 | -1.30 | 0.20 |
| Total YBOCS severity | 1.02 (0.95 – 1.10)  | 0.04 | 0.57  | 0.57 |
| Proband Status       | 1.55 (0.37 – 6.56)  | 1.14 | 0.60  | 0.55 |
| Definite Hoarding    | 9.54 (2.94 – 30.93) | 5.72 | 3.76  | 0.00 |
| Depressive Disorder  | 0.57 (0.18 – 1.84)  | 0.34 | -0.93 | 0.35 |
| Costa Rican          | 0.45 (0.07 – 2.82)  | 0.42 | -0.85 | 0.39 |

*X<sup>2</sup>*=17.84, *p*=0.0127

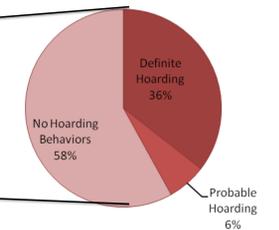
## Results

- 20.4% met criteria for definite or probable ADHD (an additional 13.6% met symptom criteria for ADHD, but did not meet age of onset and impairment criteria)

**ADHD Symptoms in Full Sample**

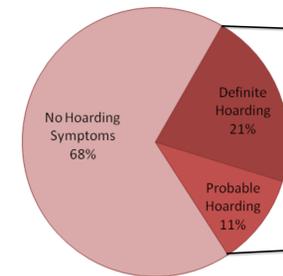


**Hoarding in ADHD**

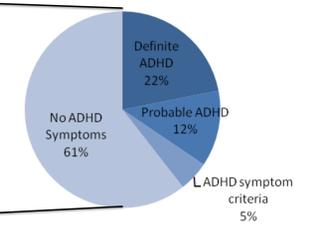


- 32.5% met criteria for either definite or probable hoarding, 39.4% of whom met ADHD symptom criteria

**Hoarding in Full Sample**



**ADHD Symptoms in Hoarding**



## Conclusions

- Prevalence of definite ADHD in OCD: higher than general population (11% vs. 5%); lower than studies including tic disorders, similar to studies excluding tic disorders
- Increased rates of hoarding in ADHD; definite hoarding was the single predictor for ADHD
- Family studies show co-segregation of OCD and ADHD in some families, suggesting distinct familial subtype
- Possible bilineal mating
- Possible similar or overlapping etiologies for ADHD and hoarding
- Possible common disinhibition syndrome in ADHD and hoarding
- Further examination of OCD, ADHD, and hoarding in family and twin samples is warranted

## Acknowledgments

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