Wonder Girls to Wonder Women: Lessons Learned from a Longitudinal Study of Girls with ADHD

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Berkeley Girls with ADHD Longitudinal Study (BGALS) Overview

Four phases of data collection

  - Mean age 9.5
- 5-year follow-up
  - Mean age 14.2
  - 10-year follow-up
    - Mean age 19.6
- 16-year follow-up
  - Mean age 25.6
ADHD Subtypes

• **Predominantly Inattentive Presentation**
  - Most likely diagnosis for girls
  - Most likely to be diagnosed later, such as in teens
  - Most common in the community

• **Combined Presentation**
  - Most common among referred children/adolescents
  - Associated with most severe impairments and worse long-term outcomes

• **Predominantly Hyperactive-Impulsive Presentation**
  - Typically limited to preschoolers
  - Likely a precursor to Combined subtype
BGALS Summer Program
Assessments

• Age range 6 to 12
• 8-hour, multi-informant diagnostic assessments
• N = 228, ~ 76 at each camp
  ▪ n = 93 ADHD-Combined
  ▪ n = 47 ADHD-Inattentive
  ▪ n = 88 age & ethnicity-matched Comparison
• Ethnically and socioeconomically diverse
• ODD, CD, anxiety and depression comorbidities
BGALS Summer Camps

• 5-week, full-day camps

• Three age based groups, mixed ADHD/Comparison

• Classroom, art, sports, dance/movement classes, drama, swimming

• No treatment, but soft token economy with “store” on Fridays

• Behavior observation coders

• Daily behavior ratings from all staff
  ▪ Overt/relational aggression, internalizing

• Sociometric interviews at weeks 1, 3, 5
BGALS Summer Programs: Results

• ADHD, both subtypes: cognitive and achievement scores average, but lower than Comparison
  ▪ No subtype differences

• Executive function deficits for ADHD vs. Comparison
  ▪ Almost no subtype differences
BGALS Summer Programs: Results

Externalizing behaviors
- ADHD-C > ADHD-I > Comparison

Internalizing behaviors
- ADHD-C vs. ADHD-I: no differences per self and parent
- ADHD-C > ADHD-I: per camp observations
- ADHD both types > Comparison

Peer Regard/Sociometrics
- ADHD: lower social preference than Comparison, weeks 1, 3, 5
- Positive nominations: no ADHD subtype difference
- Negative nominations: ADHD-C > ADHD-I
- ADHD-Inattentive: Ignored/isolated
BGALS Summer Programs:
Overt & Relational Aggression

• ADHD -C > ADHD-I > Comparison

• Relational aggression & peer nominations

• Relational aggression contributes incremental variance – above and beyond physical aggression – to predicting peer rejection
5-Year Follow-up: Adolescence

- Ages 11 to 18 (M = 14.2)
- n = 209 (of 228, 92% retention)
- Multi-informant assessment
- Stimulants within past year:
  - 45% of ADHD-Combined
  - 27% of ADHD-Inattentive
- Psychotropics within past year:
  - 57% of ADHD-Combined
  - 44% of ADHD-Inattentive

Hinshaw et al. (2006)
5-Year Follow-up: Adolescent ADHD Status

**ADHD-Inattentive (n = 41)**
- 26 (63%) ADHD-Inattentive
- 4 (10%) ADHD-Combined
- 1 (2%) ADHD-H/I
- 10 (24%) No ADHD diagnosis

**ADHD-Combined (n = 85)**
- 33 (39%) ADHD-Combined
- 20 (24%) ADHD-Inattentive
- 3 (4%) ADHD-H/I
- 29 (34%) No ADHD diagnosis

**Comparisons (n = 81)**
- 77 (95%) No ADHD diagnosis
- 4 (5%) ADHD-Inattentive

Hinshaw et al. (2006)
5-Year Follow-up: Adolescent Results

**Childhood ADHD:**
- Elevated externalizing and internalizing problems
- Elevated social skills problems
- Lower academic achievement
- More negative self-perceptions
- Higher rates of school services (79% ADHD-C; 82% ADHD-I; 13% Comparison)
- Higher rates of non-school services (70% ADHD-C; 72% ADHD-I; 32% Comparisons)

Hinshaw et al. (2006)
5-Year Follow-up: Adolescent Results

- Overall, few ADHD-C vs. ADHD-I differences
  - ADHD-Combined: more conduct disorder, less peer acceptance, more peer conflict

- No childhood ADHD differences for
  - Self-reported levels of delinquency
  - Substance use
  - Number of delinquent peers

Hinshaw et al. (2006)
10-Year Follow-up:
Young Adulthood

- Ages 17 to 24 (M = 19.6)
- n = 216 (of 228, 95% retention)
- Assessment with: participant + parent
10-Year Follow-up: Young Adult ADHD Status

Based on childhood/baseline diagnosis

- **ADHD-Inattentive (n = 41)**
  - 16 (39%) ADHD-Inattentive
  - 9 (22%) ADHD-Combined
  - 16 (39%) No ADHD diagnosis

- **ADHD-Combined (87)**
  - 32 (37%) ADHD-Combined
  - 15 (17%) ADHD-Inattentive
  - 2 (2%) ADHD-Hyperactive/Impulsive
  - 38 (44%) No ADHD diagnosis

- **Comparison (86)**
  - 75 (87%) No ADHD diagnosis
  - 8 (9%) ADHD-Inattentive
  - 2 ADHD-H/I; 1 ADHD-Combined

Hinshaw et al. (2012)
10-Year Follow-up: Young Adult Results

- Continued impairment for those with childhood ADHD was found, despite the finding that 40% or more no longer met ADHD criteria.

- For young adults with childhood ADHD:
  - Higher externalizing and internalizing problems
  - Higher rates (30.7% vs. 6.3% for Comparison) of intimate partner violence
  - Lower academic achievement scores
  - Completed fewer years of school
  - Higher utilization rates for school services and mental health treatment

- No significant differences for childhood ADHD vs. Comparison for self-reported driving problems and substance use.

Hinshaw et al. (2012); Guendelman et al. (2016)
10-Year Follow-up: Young Adult Results

- Very few childhood ADHD-Inattentive and ADHD-Combined differences
- Exception was for non-suicidal self injury (NSSI) and suicide attempts
16-Year Follow-up: Adulthood

- Ages 21.6 to 29.8 (M = 25.6)
- n = 210 (of 228, 92% retention)
- 126 with childhood ADHD were retained
  - Of these, 72 (57%) met ADHD criteria
16-Year Follow-up: Adult ADHD Status

• Comparisons: $n = 87$

• Desisters: childhood ADHD \textit{only}
  - $n = 32; \, 26\%$

• Partial Persisters: childhood ADHD + young adult OR adult ADHD
  - $n = 38; \, 30.9\%$

• Persisters: childhood, young adult, and adult ADHD
  - $n = 53; \, 43\%$
16-Year Follow-up: Adult Results

• Persisters or Partial Persisters vs. Comparison:
  ▪ Educational under-attainment; occupational impairment; social problems
  ▪ Increased BMI & unplanned pregnancies
  ▪ More self-injury, suicide attempts
    ▪ But lower rates than at the previous follow-up
  ▪ Internalizing problems, externalizing problems

• Desisters (childhood limited ADHD) vs. Comparison:
  ▪ Academic under-achievement, unplanned pregnancy, increased BMI

Owens et al. (2017)
16-Year Follow-up: Adult Results, Unplanned Pregnancies

- Rates of unplanned pregnancies:
  - Comparison: 10.6%
  - Desisters: 48.4%
  - Partial persisters: 40.5%
  - Persisters: 39%

Owens et al. (2017)
16-Year Follow-up: Adult Results

ADHD NOT associated with
- Employment attainment
- Substance use and abuse
- Driving problems

Owens et al. (2017)
16-Year Follow-up: Borderline Personality Disorder

- SCID II BPD module administered
- 17 BGALS adults met BPD criteria
  - Childhood comparison: n = 4 (5.2%),
  - Childhood ADHD-Inattentive: n = 3 (7.9%)
  - Childhood ADHD-Combined: n = 10 (13.0%)
- For NSSI: ADHD and BPD
- For suicide attempts: BPD only
Treatments utilized at any time between follow-up studies:

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<th></th>
<th>ADHD Med</th>
<th>Non-ADHD Med</th>
<th>Mental Health Treatment</th>
<th>School Services</th>
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<td><strong>Adolescent ADHD (W2)</strong></td>
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<tr>
<td>ADHD-Combined</td>
<td>51%</td>
<td>72%</td>
<td>90%</td>
<td>85%</td>
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<tr>
<td>ADHD-Inattentive</td>
<td>42%</td>
<td>52%</td>
<td>75%</td>
<td>79%</td>
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<tr>
<td><strong>Young Adult ADHD (W3)</strong></td>
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<tr>
<td>ADHD-Combined</td>
<td>70%</td>
<td>46%</td>
<td>89%</td>
<td>79%</td>
</tr>
<tr>
<td>ADHD-Inattentive</td>
<td>39%</td>
<td>28%</td>
<td>69%</td>
<td>51%</td>
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<tr>
<td><strong>Adult ADHD (W4)</strong></td>
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<tr>
<td>Partial Persisters</td>
<td>35%</td>
<td>41%</td>
<td>50%</td>
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<tr>
<td>Persisters</td>
<td>65%</td>
<td>55%</td>
<td>73%</td>
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Current Medication at Assessment Visit:

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<th>ADHD Med</th>
<th>Other Psychotropic</th>
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<tr>
<td>Partial Persisters</td>
<td>13%</td>
<td>24%</td>
</tr>
<tr>
<td>Persisters</td>
<td>30%</td>
<td>30%</td>
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Summary

• For many girls and young women, ADHD is impairing throughout adolescence and into adulthood.
• Childhood-limited ADHD still can show later problems, such as poor health outcomes and unplanned pregnancies.
• Few ADHD-Combined vs. ADHD-Inattentive differences observed on most measures in childhood, adolescence, and young adulthood (exception: NSSI, suicide attempts)
• No “male” and “female” variations of ADHD; looks more similar than distinct, but females show some key differences in outcome
• We have treatments that work! But many with ADHD are not in treatment, especially behavioral treatments.
Questions?