Psychiatric and Medical Conditions Among Adults with ASD

Lisa Croen, PhD
Children with ASD have increased rates of medical and psychiatric conditions.
Children with ASD become adults with ASD
ASD in Adults Study Objectives

- Health status of adults with ASD
- Health care utilization among adults with ASD
- Healthcare provider knowledge and experience
Study Population

- Adults 18+ years of age
- Kaiser Permanente Northern California (KPNC) member for 9+ months per year
- 2008-2012

**ASD CASES (N = 1,507)**
- 2+ ASD diagnoses recorded in KPNC medical record
- Anytime through Dec 31, 2012

**CONTROLS (N = 15,070)**
- No ASD diagnoses
- Randomly sampled at 10:1 ratio
- Matched to cases on total length of KPNC membership, sex and age
Health Status Definitions

All conditions recorded in the electronic medical record between 2008-2012

- Validated algorithms using ICD-9 codes, lab results, medications
- Linkage to cancer and diabetes registries
- ICD-9 code groupings based on PheWAS
- Body Mass Index calculated at office visits
## Demographic Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Adults with ASD (N=1,507)</th>
<th>Controls (N=15,070)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age, mean (SD)</strong></td>
<td>29.0 (12.2)</td>
<td>29.4 (12.1)</td>
</tr>
<tr>
<td>&gt;35</td>
<td>26%</td>
<td>26%</td>
</tr>
<tr>
<td><strong>Race/ethnicity, %</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White, non-Hispanic</td>
<td>65.6%</td>
<td>44.0%</td>
</tr>
<tr>
<td>White, Hispanic</td>
<td>3.9%</td>
<td>4.2%</td>
</tr>
<tr>
<td>Black</td>
<td>7.6%</td>
<td>7.3%</td>
</tr>
<tr>
<td>Asian</td>
<td>11.1%</td>
<td>16.8%</td>
</tr>
<tr>
<td>Other</td>
<td>11.7%</td>
<td>27.7%</td>
</tr>
<tr>
<td><strong>Sex, %</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>73.5%</td>
<td>73.2%</td>
</tr>
<tr>
<td>Female</td>
<td>26.9%</td>
<td>26.9%</td>
</tr>
</tbody>
</table>
### Phenotypic Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Adults with ASD (N=1,507)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ASD Diagnosis</strong></td>
<td></td>
</tr>
<tr>
<td>Autistic Disorder</td>
<td>37.2%</td>
</tr>
<tr>
<td>Asperger Syndrome</td>
<td>29.7%</td>
</tr>
<tr>
<td>Not specified</td>
<td>33.1%</td>
</tr>
<tr>
<td><strong>Intellectual Disability</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>19.2%</td>
</tr>
<tr>
<td>Mild</td>
<td>12.8%</td>
</tr>
<tr>
<td>Moderate</td>
<td>3.1%</td>
</tr>
<tr>
<td>Severe</td>
<td>6.2%</td>
</tr>
<tr>
<td>NOS</td>
<td>77.9%</td>
</tr>
<tr>
<td>No</td>
<td>80.8%</td>
</tr>
</tbody>
</table>
Psychiatric Conditions

- Anxiety: OR=3.7
- Depression: OR=2.9
- ADHD: OR=5.3
- Bipolar disorders: OR=5.8
- Schizophrenia: OR=22
- OCD: OR=14.6
- Suicide attempts: OR=5.0

Blue bars represent ASD, red bars represent Controls.
Drug and Alcohol Use

<table>
<thead>
<tr>
<th>Condition</th>
<th>ASD</th>
<th>Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug abuse</td>
<td>2.57</td>
<td>3.03</td>
</tr>
<tr>
<td>Drug dependency</td>
<td>1.81</td>
<td>2.12</td>
</tr>
<tr>
<td>Alcohol abuse</td>
<td>4.52</td>
<td>4.95</td>
</tr>
<tr>
<td>Alcohol dependency</td>
<td>2.24</td>
<td>2.64</td>
</tr>
</tbody>
</table>

OR = 0.67 for Drug dependency
OR = 0.75 for Drug abuse
OR = 0.49 for Alcohol abuse
OR = 0.44 for Alcohol dependency
GI, Immune, Sleep, Thyroid

- OR=1.3
- OR=1.4
- OR=1.2
- OR=1.2
- OR=1.9
- OR=2.5

Gastrointestinal disorders
Autoimmune diseases
Asthma
Sleep disorders
Thyroid disease

ASD
Controls

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Metabolic Conditions

- Hypertension: OR=2.2
- Obesity: OR=1.4
- Dyslipidemia: OR=2.1
- Diabetes: OR=2.2

Legend:
- Blue: ASD
- Red: Controls
Other Medical Conditions

- Renal disorders: OR=1.3
- Musculoskeletal: OR=2.9
- Pulmonary: OR=1.3
- Hearing impairment: OR=2.3
- Vision impairment: OR=7.8
- Genetic disorders: OR=14.7

Note: OR=1.3, OR=2.9, OR=1.3, OR=2.3, OR=7.8, OR=14.7

Legend:
- ASD
- Controls
Neurologic Conditions

Epilepsy
- OR=16

Other CNS disorders
- OR=5.0

Stroke
- OR=2.1

Parkinsons
- OR=32

Dementia
- OR=4.4

Percent

ASD

Controls
Alcohol and Tobacco Use
Self-Reported

- Alcohol use
- Smoking

Percent

ASD
Controls
Conditions Less Common in ASD

- Infection: OR=0.82
- Migraine: OR=0.75
- Genitourinary Disorders: OR=0.65
- Cancer: OR=0.66

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Summary and Conclusions

- Evidence for increased rates of many health conditions in ASD
- Some evidence for common biologic causes
  - E.g., shared genetic susceptibility to several psychiatric disorders including ASD
  - Obesity is a risk factor for several chronic conditions observed in autistic adults
- Communication and social impairments and sensory issues impede preventive health, early diagnosis, timely treatment
- Need health education and lifestyle interventions early on to improve diet, exercise, and reduce risk factors for chronic illnesses
- Need better integration of people with ASD into all aspects of society to reduce social isolation, discrimination and lower burden of disease
Research Opportunities

- Understand the social, health care access, and biologic mechanisms underlying the increased rates of medical and psychiatric conditions
- Understand how physicians investigate and manage chronic disease in adults with ASD
- Develop and test improved strategies for delivering health care to adults with ASD
Acknowledgments

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Clinical Partners
Children and Adults with ASD and Families