Emotional lability in adults with ADHD: a core feature

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Disclosures – Professor Philip Asherson

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• Honoraria at sponsored meetings: Lilly, Shire, Novartis

03/07/2014
ADHD characterised by two or more symptom domains

Phenotypic correlations ~0.60
Genetic correlations ~0.60
Both dimensions similarly heritable ~0.75
Emotional lability (EL)

Excessive emotional reactions, frequent mood changes: Irritability, volatility, hot temper

60-70% heritable

Symptoms of Emotional Impulsiveness in an adult follow-up (mean = age 27) sample of children with ADHD and community controls

Barkley and Fischer, JAACAP, 2010
The unique contribution of Emotional Impulsiveness to psychosocial impairments

Severity of Emotional Instability uniquely contributed to numerous impairments:

- Home life
- Occupation
- Education
- Criminal Activity
- Driving
- Financial outcomes

“EI is as much a component of ADHD as the two traditional dimensions”
Does emotional lability reflect a third dimension of psychopathology in adult ADHD?

- Treatment effects
- Case control differences
- Contribution to impairment
- Shared genetic risk factors
Treatment
Main areas of improvement

**Better able to focus:** better able to focus on and complete tasks. Less mind wandering. Helps in education and planning for the future

**Less restless:** less mentally and physically restless, improved sleep.

**Mood more stable:** feeling much calmer and more in control of emotional reactions
Wender-Reimherr Interview for Adult ADHD
Emotional Dysregulation Scale

<table>
<thead>
<tr>
<th>Affective lability</th>
<th>Temper control</th>
<th>Emotional over-reactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mood fluctuations</td>
<td>Irritability</td>
<td>Overwhelmed</td>
</tr>
<tr>
<td>Dysphoric periods</td>
<td>Temper Outbursts</td>
<td>Emotional reactivity</td>
</tr>
<tr>
<td>Boredom</td>
<td>Lack of control</td>
<td>Impairment</td>
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<tr>
<td>Overstimulation</td>
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Treatment response to methylphenidate (Cohen’s d)

- Total WRADDS score: 0.83
- Attention / disorganisation: 0.82
- Hyperactivity / impulsivity: 0.93
- Emotional dysregulation: 0.7
- DSM-IV ADHD: 0.69
- Inattention: 0.73
- Hyperactivity-impulsivity: 0.75

Reimherr et al., 2007, JCP

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MPH Treatment in Adult ADHD
Decline of WRI Emotional Dysregulation scores over 24 weeks

\[ d = 0.37 \] for Emotional dysregulation

\[ d = 0.39 \] for DSM-IV ADHD

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**MIRIAD project**

Highly selected sample with no comorbidity and medication free

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**Recruitment Phase**

- **508** men referred to Maudsley Hospital adult ADHD Clinic between June 2009 and March 2011. All medical records and referral letters screened for study inclusion/exclusion criteria.

**Most common exclusions**

- **321 individuals excluded**
  - Other mental health problems: N=162 (e.g. autism: N=45, major depression: N=40; OCD or Tourettes: N=27)
  - Current psychoactive medication: N=150
  - Substance abuse or addiction: N=96
  - Head injury, neurological condition or major cognitive impairment: N=28
  - More than one of the above in 44% of exclusions.

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**Screening by telephone**

- **133 individuals excluded**
  - On medication: N=36
  - Not interested: N=32
  - Other mental health problems: N=21
  - Frequent substance use: N=19
  - Unable to contact: N=14

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**Clinical assessment for ADHD**

- **13 individuals excluded**
  - Comorbid anxiety disorder and/or OCD: N=4
  - Not diagnosed with adult ADHD: N=4
  - ADHD in remission: N=3
  - Not completing diagnostic assessment: N=2

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**Final Sample N=41**
Affective Lability Scale (ALS)

Swift changes from normal mood to other emotional modalities: *elation, depression and anger*  

Centre for neurologic studies Lability scale (CNS-LS)

Measure of negative emotions (*getting frustrated, angry and upset*)  

Oliver & Simons (2005).

Moore et al (1997)
Case-control differences for emotional lability scores

All p < .001

<table>
<thead>
<tr>
<th></th>
<th>Sensitivity</th>
<th>Specificity</th>
</tr>
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<tbody>
<tr>
<td>CNS-LS</td>
<td>.88</td>
<td>.83</td>
</tr>
<tr>
<td>ALS-SF</td>
<td>.85</td>
<td>.81</td>
</tr>
</tbody>
</table>

Skirrow & Asherson 2012, JAD, 2013

Slides from Prof Philip Asherson or UKAAN
The Experience sampling method (ESM)

- Participant wears a watch which vibrates at varying intervals
- Then they fill out a questionnaire on the PDA
- Responses collected 8 times a day for a working week (mon-fri)
Anger ratings for individuals with ADHD and healthy controls over the 5-day period

(Matched for age, IQ and years in education)

Adapted from Skirrow et al., Pschol Med, 2014; KCL PhD 2013
Experience sampling of emotional symptoms

Skirrow et al., Pschol Med, 2014

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Average duration from reporting of bad event (mins)
Sources of family resemblance and differences

.resemblance

genes

shared environment

ADHD

differences

non-shared environment

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ADHD characterised by two or more symptom domains

Inattention

Hyperactivity/impulsivity

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Slides from Prof Philip Asherson of UKAAN
Twin samples

(1) Manchester twin sample (n=1920):
   - parent ratings of EL
   - mean age 11.2 (5-18 years)

(2) Swedish Twin Study of Child and Adolescent Development (n=534)
   - maternal ratings of DESR
   - mean age 19.7 (19-20 years)
Emotional Lability in children and adolescents (1,920 twin pairs aged 5-18)

<table>
<thead>
<tr>
<th>Parent rated Conners scale</th>
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<tr>
<td>Temper outbursts: explosive unpredictable behaviour</td>
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<tr>
<td>Crying often and easily</td>
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<tr>
<td>Mood changes quickly and drastically</td>
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</table>
Phenotypic analyses

1,920 twin pairs from Greater Manchester Twin Register: mean age = 11.2 years

Phenotypic correlations

- HI - IA: 0.70 (0.62, 0.72)
- HI - EL: 0.63 (0.61, 0.65)
- IA - EL: 0.58 (0.56, 0.60)

Merwood et al., JAACAP, 2014
A single heritable latent factor accounted for covariation of emotional lability with inattention and hyperactivity-impulsivity

Younger cohort (5-10)
- HI: .77
- IA: .71
- EL: .50

Older cohort (11-18)
- HI: .76
- IA: .71
- EL: .61

Merwood et al., JAACAP, 2014
Swedish twin sample
DESR items (19-20 years)

• **Attention problems:** Acts young, fails to finish tasks, concentration, sits still, confused, daydreams, impulsive, poor school performance, inattentive, stares

• **Aggression:** Argues, mean, demands attention, destroys own property, destroys others property, disruptive at home, disruptive at school, fights, attacks others, screams, stubborn, mood changes rapidly, sulks, suspicious, teases others, temper outbursts, threatens others, loud

• **Anxious/ depressed:** Cries, fears, fears school, fears doing badly, perfectionism, feels unloved worthless, nervous, fearful, guilty, self conscious, suicidal, worries
Phenotypic correlations

ADHD dimensions + DESR:
Inattention (IA)
Hyperactive/impulsive (HI)
Aggression (AG)
Anxious/depressed (AD)

0.50 (0.44, 0.54)
0.55 (0.50, 0.59)
0.47 (0.42, 0.52)
0.44 (0.39, 0.49)
0.32 (0.26, 0.38)

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Merwood, PhD, KCL, 2013
Common pathway models

A
\[0.81\]

E
\[0.19\]

F
\[0.46\]
\[0.48\]
\[0.58\]
\[0.34\]

IA
\[0.17\]
\[0.37\]

HI
\[0.18\]
\[0.34\]

AG
\[0.15\]
\[0.27\]

AD
\[0.28\]
\[0.38\]
Conclusions

- EL is a common feature of ADHD
- EL is seen in non-comorbid adults with ADHD
- Unique source of impairment
- EL shows response to ADHD drug treatments
- EL shares genetic liability with core ADHD symptoms

Aetiology?: Likely to reflect genetic pleiotropy with distinct underlying neurobiology
Comment

- DSM classification system is designed to categorise patients
- DSM is NOT designed to reflect all symptoms and impairments ("utility not scientific validity")
- Nevertheless DSM-5 lists EL as characteristic feature of ADHD that supports the diagnosis

ADHD should always be considered in the differential diagnosis of cases presenting with chronic mood instability