ADHD, ASC & Asperger’s

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Disclosure / Conflict of Interests...

• Grant funding from Research Councils and Institutions.
• Co-Director of MyChild Services Ltd. *[SEND, Education]*
  • Provide psychological (educational) assessments to families and Locum Educational Psychologist services to Local Authorities and Multi-Academy Trusts. *No DX.*
Outline

• Why we should consider ADHD and Autism in the same breath.
• The relationship between ADHD and Autism.
• Past and present research.
• Some projects we have been involved with.
• Implications for applied practice.
ADHD is characterized by developmentally inappropriate **inattention**, **impulsiveness**, and/or **hyperactivity** that remain relatively persistent over time and result in impairment across multiple domains of life activities.

Autism is characterized by persistent deficits in **social interaction** and **communication** (e.g., poor social-emotional reciprocity, deficits in nonverbal communication, deficits in developing relationships) as well as **restricted, repetitive patterns of behaviour, interests, or activities**.
The ‘Triad of Impairment’ in Autistic Disorder under DSM-IV.

- Impairment in social interaction.
- Impairment in verbal and non-verbal communication.
- Restricted, repetitive and stereotyped patterns of behaviour.
However, the ‘Triad’ is now a ‘Dyad’ in Autism Spectrum Disorder under DSM-5.

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Deficits in Social Interaction and Communication.

Restricted, repetitive patterns of behaviour, interests, or activities.

New ‘domains’ of Autism under DSM-5 – each with 3 levels of severity.

Level 1 – “requiring support.”
Level 2 – “requiring substantial support.”
Level 3 – “requiring very substantial support.”
ADHD & Autism

• ADHD and Autism are two of the most common neurodevelopmental disorders, with a high degree of co-occurrence.

• Until DSM-5 dual diagnosis was not possible. A frequent practice was calling the symptoms of hyperactivity and inattention in autism ‘ADHD-like’ rather than ADHD.

• Over the last few decades, the debate on the limits between the two disorders has continued.

• A commonality between the conditions is maintaining (relevant) focus.
Comorbidity of ADHD and Autism

- Both conditions co-occur with a high frequency, with 20–50% of children with ADHD meeting criteria for Autism and 30–80% of children with Autism meeting the criteria for ADHD (Rommelse, Franke, Geurts, Hartman, & Buitelaar, 2010).

- In a large study, 30% of children with high-functioning autism met diagnostic criteria for ADHD and of these, an additional 25% exhibited elevated ADHD symptoms (Leyfer et al., 2006).

- In another exploratory study, over half of a sample of 83 children with Autism fulfilled the full diagnostic criteria for ADHD (Sinzig, Walter, & Doepfner, 2009).
A review of 33 studies showed evidence that the prevalence of symptoms of ADHD in children with Autism was 33-37% (Berenguer-Forner, Miranda-Casas, Pastor-Cerezuela, & Roselló-Miranda, 2015).

A study of 17,000 children concluded that children with autism rarely show hyperactivity alone but often have co-occurring impulsivity and inattention (Ronald, Larsson, Anckarsäter, & Lichtenstein, 2014).

- 82% of the boys and 95% of the girls with autism showed impairments on at least one of the ADHD domains (inattention, hyperactivity, impulsivity).
- 42% of the boys and 62% of the girls with Autism showed impairments on at least two ADHD symptom domains.

This suggests that most children with Autism (particularly girls) suffer from co-occurring ADHD symptoms in some form.
Neurological Differences in ADHD and Autism

• Several structural and functional imaging studies have compared brain characteristics in adolescents with autism and ADHD but no consistent pattern has emerged (Brieber et al., 2007; Christakou et al., 2013).

• Brain structure differences have been shown between people with ADHD and autism (Dougherty, Evans, Myers, Moore, & Michael, 2016).
  • Increased total brain volume (than controls) in people with autism.
  • Decreased total brain volume in people with ADHD.
  • Both had lower volume in the corpus callosum and cerebellum (structural MRI).

• Neuroimaging techniques, in the long run, may help identify neurobiological markers to assist clinical diagnosis and treatment.
Shared Genetic Risk Factors

- Neuroimaging and anatomical studies have also shown similarities between the two disorders.
- Given the size of the overlap, researchers are beginning to rethink the relationship between the two conditions and to look for common biological roots.
- Genetic studies suggest the two conditions share genetic risk factors (Lionel et al., 2011).
  - See Dr Jonna Martin’s talk yesterday on ‘What can Genetics tell us about ADHD?’
- The data collected agree on a genetic overlap between ADHD and autism, which is influenced by common molecular mechanisms that affect the two disorders at the same time (Artigas-Pallarés, 2013).
Social Difficulties across ADHD and Autism

• The most prevalent autistic traits seen in children with ADHD are social and communication difficulties (Miranda-Casas, Baixauli-Forte, Colomer-Diago, & Roselló-Miranda, 2013).

• The social difficulties are often reported in children with ADHD.

• These difficulties are typically interpreted as resulting from ADHD symptoms rather than reflecting the qualitative impairments in social-communicative functioning characteristic of Autism.
Children with **Reading Disorder** often show early evidence of combined childhood disorders including ADHD and Autism (Hendren, Haft, Black, White, & Hoeft, 2018).

**Reading comprehension** problems of children with attention difficulties are related to poor word reading and that listening comprehension is particularly vulnerable in children at risk of ADHD (Cain & Bignell, 2014).

Children with poor attention and elevated levels of hyperactivity are associated with **pragmatic language weaknesses** (Bignell & Cain, 2007).
Changing Symptom Co-occurrence over the Lifespan

• The literature on the co-occurrence is strongly biased by a focus on childhood.

• A review of studies across lifespan on core and related symptoms of ADHD and autism (Hartman, Geurts, Franke, Buitelaar, & Rommelse, 2016) showed that symptoms peak during adolescence (when social adaptation and EF skills matter most), and are lower in early childhood and old age.

• Likewise, a review of the literature was conducted on children with autism and ADHD (Visser, Rommelse, Greven, & Buitelaar, 2016).
  • The co-occurrence of autism and ADHD increases with age, severity of symptoms and lower IQ.
  • Attention problems form a ‘linking pin’ between early Autism and ADHD.
Additive Effects of ADHD and Autism

• There is evidence from review studies of an additive effect of having the clinical profile of ADHD plus Autism.

• In a review (Murray, 2010) people with co-occurring Autism and ADHD symptoms were found to be more severely impaired than those with a single condition.
  • Problems were seen in social interaction, everyday skills for successful living, and executive control.

• The overlapping of Autism + ADHD gains some of the deficits from both disorders and has implications for the evaluation and design of effective treatments.
Taking ADHD and Autism to the Public

Massive Open Online Course (MOOC).
FREE – University of Derby

‘Understanding Autism, Asperger’s & ADHD’

- Expanding evidence-based academic knowledge to the public.
- Over 25,000 people have taken the course since 2016 (18% completion).
- Endorsed by The ADHD Foundation.
- Informed by stakeholders.
- Over 500 people registered to watch the live webinar.
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Taking ADHD and Autism to the Public

“I have an adult son diagnosed primarily with Oppositional Defiant Disorder and ADHD and wanted to understand more about the conditions.”

“I identified several ‘symptoms’ in myself that I had not thought about before doing this course. Being a teacher of teens (13-16 years), I see an increasing number of students exhibiting traits which people would say are ‘autistic’. I wanted to know whether this was accurate, since there seemed to be a wide range of behaviours exhibited under that label.”

“Being a teacher of teens (13-16 years), I see an increasing number of students exhibiting traits which people would say are ‘autistic’. I wanted to know whether this was accurate, since there seemed to be a wide range of behaviours exhibited under that label.”

“I had studied Autism before but was surprised how much more I learned, especially about ADHD." 

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• Videos, Interviews, Forum, Assessment, Quiz, Self-assessment, Digital Badges, Certificate of Completion.
Autism Profiling Tool
PhD Student Alexandra Karousi
Supervised by Dr Simon Bignell, Dr Chris Barnes, Dr Sigrid Lipka

• An Individualised Autism (*and comorbidities*) Profiler.
• An evidence-based reporting tool that will bring together multiple sources of data about the child’s unique characteristics and their specific relationship to the clinical markers of autism and comorbidities.
• To bridge the gap between clinical descriptions and the child’s unique characteristics, strengths and weaknesses.
  ➢ *How do parents understand their child with autism?*
  ➢ *What data is available and how is it used?*
  ➢ *Theoretical and statistical considerations of assessment ‘data’.*
• For parents, educationalists and healthcare professionals.
• Ultimately to inform highly individualised intervention strategies.
Looking Forward...

• An important research goal is to thoroughly map these characteristics across multiple sources in the individual.

• Despite increased interest in co-occurring ADHD and autism, relatively little research has been devoted to treatment considerations (Davis & Kollins, 2012).

• Treatment development will benefit from an enhanced understanding of the phenomenon of co-occurring ADHD and autism.

• Crucial to follow the latest NICE guidance for each condition.

• Understanding of ADHD, Autism and their overlap would benefit from an increased focus on cross-disorder comparisons in well-powered samples and longitudinal cohorts.
• ADHD and autism are both highly heritable neurodevelopmental conditions of brain development with some **similar** and some **distinct** characteristics.

• While there is a growing research literature on this association, more studies are needed of **when to intervene** and of the early and long-term benefits of **comprehensive intervention**.

• Many individuals with autism have **undiagnosed** ADHD, and vice versa (but slightly less).

• Some researchers have suggested that **Autism and ADHD are one overarching disorder with a range of subtypes**, each having a distinct time of onset, mix of traits and progression (van der Meer et al., 2012).


Lionel, A. C., Crosbie, J., Barbosa, N., Goodale, T., Bignell, S., & Cain, K. (2011). Rare copy number variation discovery and cross-disorder comparisons identify risk genes for ADHD. Science Translational Medicine, 3(95), 59ra75. https://doi.org/10.1126/scitranslmed.3002464


Images sourced from www.pexels.com and University of Derby.
Book Release

Autism, Asperger’s & ADHD
What You Need to Know.
By Dr Simon Bignell