

Attention-deficit hyperactivity and autism spectrum disorder

THE RISING PRESENTATION IN FEMALES



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Attention-deficit hyperactivity disorder (ADHD) and autism spectrum disorder (ASD) are two neurodevelopmental disorders that typically commence in childhood.^{1,2} ADHD is characterised by presentations of inattention and /or impulsivity-hyperactivity.³ ASD is defined by social interaction and communication challenges and restrictive-repetitive behaviours with sensory sensitivity and interest differences, but there may also be attention difficulties and hyperactivity.^{3,4} Research suggests two-thirds of those with ADHD demonstrate symptoms of ASD and that approximately 30-50% of those with ASD also demonstrate symptoms of ADHD, making these conditions strongly intertwined.⁵

Both ADHD and ASD frequently coexist in families with no primary cause being noted. Interestingly, numerous environmental and genetic factors are believed to contribute, including genes involved in the transportation and metabolism of the neurotransmitters, serotonin, dopamine, and noradrenaline.^{3,6,7} Additionally, risk factors during pregnancy have been noted for ADHD and include low birth weight, maternal smoking, allergies, bacterial or viral infections, and certain autoimmune diseases.⁶

ADHD and ASD in males and females

To date, a higher prevalence of ADHD has been seen in boys, who are up to nine-times more likely to be diagnosed than girls,⁸ and in ASD, boys are three-times more likely to receive a diagnosis than girls. These figures highlight a significant bias in overall diagnosis between genders.⁹

It is now known that females tend to camouflage or compensate for symptoms of ADHD and ASD.



KEY HIGHLIGHTS

- ADHD is characterised by presentations of inattention and /or impulsivity-hyperactivity.
- ASD is defined by social interaction and communication challenges and restrictive-repetitive behaviours with sensory sensitivity and interest differences.
- ADHD and ASD are diagnosed more often in males due to different symptom presentations, with females often exhibiting less obvious symptoms.
- Females with ADHD and ASD often mask their symptoms, leading to underdiagnosis or misdiagnosis.
- Both conditions are linked to genetic and environmental factors, causing issues like gastrointestinal problems, oxidative stress, and nutrient deficiencies.
- Nutritional support and herbal remedies (e.g., Bacopa monnieri, Panax ginseng, Ginkgo biloba) can help manage symptoms.
- ADHD and ASD often run in families with risk factors including genetic variations, low birth weight, maternal smoking, and infections during pregnancy.

Emerging research shows that the disparity in the ratio of diagnoses between males and females is likely due to their differing presentations.¹⁰ This is because the diagnostic criteria for both ADHD and ASD has historically been based on the symptom profile in boys. An oversight that has meant symptom expression in females has remained largely neglected and awareness, along with education of the differences, continues to be inadequate. As a result, females are often misdiagnosed or not diagnosed until well into adulthood – if at all.^{9,11}

So much so that they may not even recognise they are neurodivergent, meaning no diagnosis is sought.^{4,12,13} Additionally, females often present with different characteristics than their male counterparts. For example, in ASD, females tend to engage in imaginative play, may have a fully developed vocabulary that can express emotions, have higher cognitive abilities and are often far more sociable.^{14,15} Additionally, they tend to internalise their emotionally troubling symptoms such as depression, anxiety, and sensory processing problems. Perfectionist tendencies and eating disorders are also common,¹⁴ with insomnia or general sleep disturbances linked to both ADHD and ASD.^{16,17}

SYMPTOM MASKING

Symptom masking is very common for females with ADHD and/or ASD, as they tend to have a better understanding of social etiquette and may be able to adapt their behaviour to conform. Examples of this from ASD research include mimicking the behaviour of those around them, learning to hold eye contact, which they might otherwise avoid, as well as developing adaptive strategies to help with focus and attention. The constant need for a social façade, and the associated cognitive effort, can take its toll, and they are much more likely to note chronic high stress, anxiety and fatigue.^{10,12}

Common issues and deficiencies

The interplay between genetic and environmental factors in ADHD and ASD can affect several processes within the body, including the formation of glutathione within the methylation cycle.^{3,6,18} Moreover, it is thought that one potential mechanism contributing to the psychiatric symptoms of ADHD is hereditary metabolic dysfunction, which restricts the availability of several important cofactors, thereby diminishing metabolic activity.¹⁹ Increased oxidative stress and mitochondrial dysfunction may also be common contributors in these conditions.^{18,20,21}

Gastrointestinal (GIT) inflammation and problems, such as constipation, diarrhoea, and abdominal pain are common in ASD, with functional GIT disorders (irritable bowel syndrome, constipation, and dyspepsia) also prevalent in those with ADHD, especially in females. These conditions may be due to food sensitivities, altered gut microbiome, and/or decreased nutritional intake.^{18,22}

Adult diagnosis of ADHD and ASD

In Australia, diagnosis of ADHD and ASD should be done by a diagnostic clinician who understands the screening tools and has experience or training in neurodevelopmental and behavioural conditions, such as psychiatrists or clinical psychologists. These appointments can be complex, involving multiple assessments with inputs from different aspects of the person's life,^{4,23,24} so many adults may choose not to pursue a formal diagnosis.

Medical management of ADHD and ASD

Medical management of adult ADHD includes educational and behavioural treatments and, if indicated, psychostimulant medications to help improve attention and reduce impulsiveness and hyperactivity.⁶ However, the side-effects associated with these medications can be intolerable and individuals may look for ways in which they can create everyday coping strategies before being medicated.^{4,25} Behavioural strategies are first-line interventions for ASD.⁴

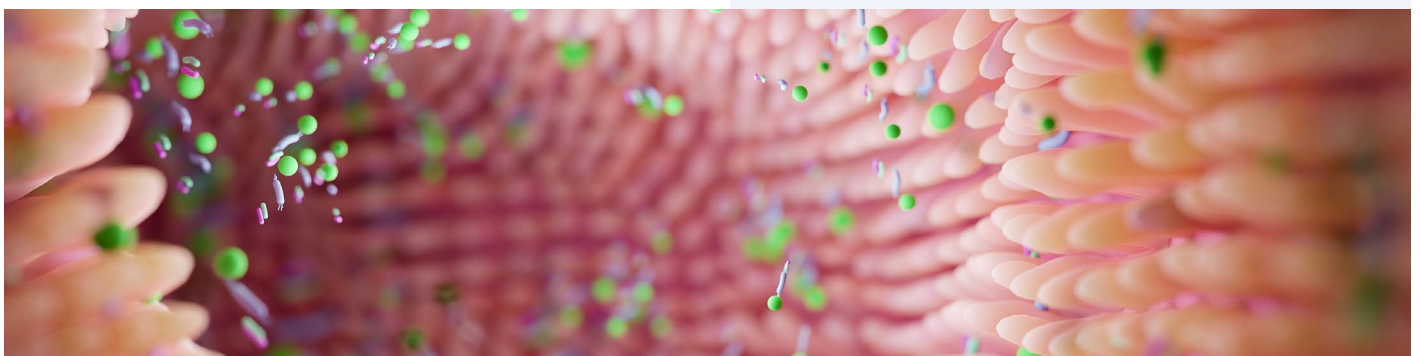
Holistic management of ADHD and ASD

Many women present to complementary health practitioners for assistance with any combination of symptoms outlined above. Based on this symptom picture, they may be treated for various conditions; however, it is important to consider if ADHD and/or ASD may be present. Particularly so if symptoms have been present for the last 10-20 years or can be traced back to childhood,²⁶ in which case referral for a diagnosis via a GP should be discussed. If neurodivergent individuals are looking for ways to manage their symptoms without medication, there are several nutrients and herbal medicines that could assist.

Nutritional support for the neurodiverse

The nutritional goals in the management of ADHD and ASD may include addressing nutrient deficiencies, improving the diet and helping to support the systems of the body, such as the nervous and digestive systems.

Major nutrient deficiencies that would benefit from screening include vitamin D, zinc, magnesium and iron,⁷ as well as vitamins A, B6, B12, K and essential fatty acids.^{7,27} Often dietary adjustments are not possible or sufficient to address these deficiencies and supplementation may be considered. Evidence also suggests that supplementing with coenzyme Q10 and L-carnitine, in combination with the vitamins and minerals shown to be deficient, can be helpful in supporting and improving mitochondrial function in ASD.¹⁸ Curcumin, luteolin, resveratrol, and quercetin may provide neuroprotective effects in both conditions while targeted probiotics may support the presenting gut concerns.^{28,29}



Herbal medicines for ADHD

There is a paucity of evidence with regards to the effectiveness of herbal medicine in ADHD. However, this evidence is growing. The following herbal medicines could be considered, depending on presenting symptoms:^{29,30}

- *Bacopa monnieri* improves memory and learning along with restlessness, impulsivity, and overall symptom picture.
- *Panax ginseng* provides antioxidant and neuroprotective effects. Alongside its capacity to produce increases in dopamine and norepinephrine, it can help to improve attention and hyperactivity.
- *Ginkgo biloba* improves core ADHD symptoms and overall quality of life. Additionally, it was found that combining it with *Panax ginseng* considerably improved ADHD symptoms.
- *Passiflora incarnata* was shown in one study to have no significant difference to the clinical effect of methylphenidate, a common ADHD medication.

Other herbs that may have potential benefits or have been studied for use in ADHD include, *Hypericum perforatum*, *Valeriana officinalis*, *Scutellaria baicalensis*, *Paeonia lactiflora*, *Withania somnifera*, *Centella asiatica* and *Melissa officinalis*.^{29,30}

SUMMARY

The rising awareness of ADHD and ASD in females underscores the need for more nuanced diagnostic criteria that account for gender differences in symptom presentation. Females often camouflage their symptoms, leading to significant underdiagnosis. Understanding the genetic, environmental, and nutritional factors that contribute to these conditions can enhance management strategies.

Recognizing and addressing these disparities will improve diagnosis and treatment outcomes for females with ADHD and ASD.

Herbal medicines for ASD

Similarly, robust supporting evidence for the effectiveness of herbal medicine in adults with ASD is scarce and largely based on children, with preclinical studies failing to effectively study all ASD behavioural changes. However, herbal medicines with properties that support the individual such as those with anxiolytic, antioxidant, neuroprotective, cognition-enhancing, serotonin modulating, and carminative actions may be considered.³¹

Using nature as a therapy

Several studies show that being exposed to nature - through walks, gardening, listening to the sound of a stream, or living somewhere with exposure to greenery - improves physical and psychological wellbeing, with research also highlighting benefits in those with ASD and ADHD.^{32,33} With this in mind, neurodivergent individuals should be encouraged to spend time in nature as often as possible.



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