Interventions for Autism

A summary of current Cochrane Reviews

Introduction

This resource provides an easily accessible and digestible summary of the Cochrane reviews which discuss interventions for autism, conducted in 2020.

What is a Cochrane review?

Cochrane reviews are high-quality systematic reviews. They are updated as needed and are commonly used to inform clinical practice e.g. in the form of NICE (National Institute for Health and Care Excellence) guidelines.

What is autism?

Autism is a lifelong developmental condition which affects the way that a person interacts with, and experiences, the world around them.

Autism is clinically defined by:

- Persistent deficits in social communication and social interaction across multiple contexts
- Restricted, repetitive patterns of behaviour, interests, or activities (1)

People with autism may have areas of strength and/or difficulty. These include:

- Strong attention to detail
- Above average technical or creative skills
- Character strengths, such as honesty and loyalty
- Differences in sensory processing, including over- and under-sensitivity
- Difficulty predicting what is going to happen next
- Difficulty knowing or understanding what other people think or feel (2)

Autism varies widely and is often referred to as a 'spectrum'. It is important to appreciate that how an autistic person appears in one environment may not be representative of how they appear in a different environment.

Why is it important to know about autism?

Autism is a common condition, affecting at least 1% of the population.

Research has shown that people with autism have poor health outcomes. Autistic people often have comorbid conditions, such as mental health conditions (e.g. anxiety, depression), and neurodevelopmental conditions (e.g. learning disabilities, epilepsy). These comorbidities often go unrecognised (2). As a consequence of this, people with autism have a reduced life expectancy. In one Swedish study, the average life expectancy of a non-autistic person was 70.2 years, compared to 53.9 years for an autistic person and 39.5 years for an autistic person with a learning disability (3).

In order to tackle these health inequalities, it is essential that we understand how autistic people can be best supported.

The review process

The authors searched the Cochrane library (search strategy: autism OR autistic OR Asperger's). 114 results were returned. Each reviewer evaluated 57 papers, and an initial selection was made. The reviewers then swapped over and evaluated the other 57 papers.

There were 3 disagreements between the reviewers (giving an inter-rater reliability of 97.4%). These 3 disagreements were resolved by discussion.

20 reviews were included in the final selection:

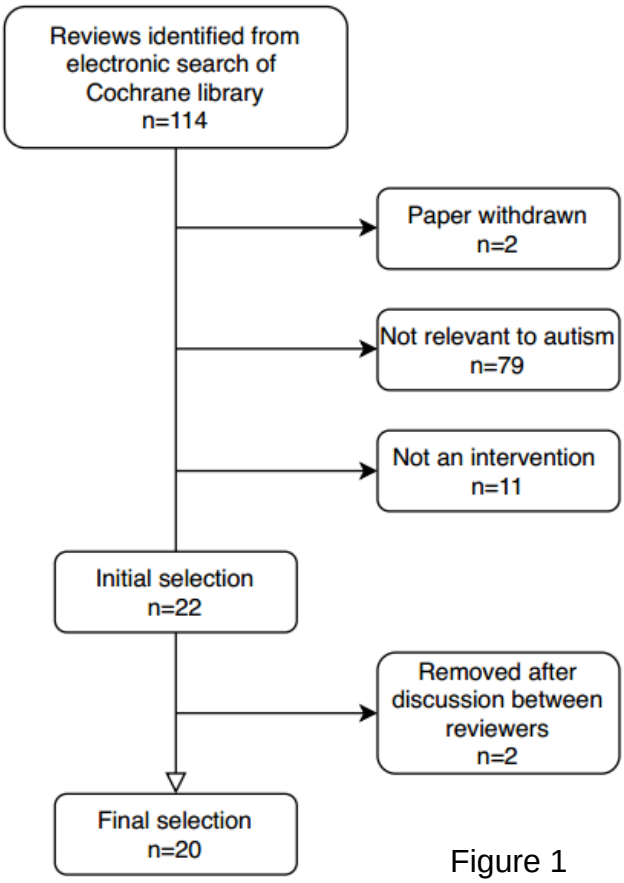

Figure 1

Findings

Further analysis of the 20 included reviews was conducted to sort the interventions into categories.

There were many possible ways in which the reviews could have been categorised. Intervention type, study population, and conclusions/recommendations were all considered. However, during the selection process, it became evident that intervention type was the most important factor in differentiating between the reviews.

The categories chosen by the reviewers were 'Complementary and Alternative Interventions', 'Pharmaceutical Interventions', and 'Social and Behavioural Interventions'.

Table 1 categorises the reviews and details their autism-related objectives and conclusions.

Table 1 – Categorisation of included reviews

Complementary and Alternative Interventions

	Title and Date	Autism Related Objectives	Autism Related Conclusions	DOI
1	**Auditory integration training and other sound therapies for autism spectrum disorders (ASD) – 2011**	To determine the effectiveness of auditory integration therapy or other methods of sound therapy in individuals with Autism Spectrum Disorders (ASD).	There is no evidence that auditory integration therapy or other sound therapies are effective as treatments for autism spectrum disorders. As synthesis of existing data has been limited by the disparate outcome measures used between studies, there is not sufficient evidence to prove that this treatment is not effective.	https://doi.org/10.1002/14651858.CD003681.pub3
2	**Chelation for autism spectrum disorder (ASD) – 2015**	To assess the potential benefits and adverse effects of pharmaceutical chelating agents for autism spectrum disorder symptoms.	No clinical trial evidence was found to suggest that pharmaceutical chelation is an effective intervention for ASD. Given prior reports of serious adverse events, such as hypocalcaemia, renal impairment and reported death, the risks currently outweigh the benefits and the safety of participants should be ensured before further trials.	https://doi.org/10.1002/14651858.CD010766.pub2
3	**Combined vitamin B6-magnesium treatment in autism spectrum disorder – 2005**	To determine the efficacy of vitamin B6 and magnesium (B6-Mg) for treating social, communication, and behavioural responses of children and adults with autism	Due to the small number of studies, the methodological quality of studies, and small sample sizes, no recommendation can be advanced regarding the use of B6-Mg as a treatment for autism	https://doi.org/10.1002/14651858.CD003497.pub2
4	**Music therapy for people with autism spectrum disorder – 2014**	To assess the effects of music therapy for individuals with ASD	Music therapy may help children with ASD to improve their skills in social interaction, verbal communication, initiating behaviour, and social-emotional reciprocity. More research is needed to corroborate these results and examine whether the effects of music therapy are long-lasting.	https://doi.org/10.1002/14651858.CD004381.pub3
5	**Acupuncture for autism spectrum disorders (ASD) – 2011**	To determine the effectiveness of acupuncture for people with ASD in improving core autistic features, as well as communication, cognition, overall functioning and quality of life, and to establish if it has any adverse effects	Current evidence does not support the use of acupuncture for treatment of ASD. There is no conclusive evidence that acupuncture is effective for treatment of ASD in children and no randomised controlled trials (RCTs) have been carried out with adults. Further high quality trials of larger size and longer follow-up are needed.	https://doi.org/10.1002/14651858.CD007849.pub2
6	**Omega-3 fatty acids supplementation for autism spectrum disorders (ASD) – 2011**	To review the efficacy of omega-3 fatty acids for improving core features of ASD (for example, social interaction, communication, and stereotypies) and associated symptoms	There is no high quality evidence that omega-3 fatty acids supplementation is effective for improving core and associated symptoms of ASD. More rigorous studies are needed in this area.	https://doi.org/10.1002/14651858.CD007992.pub2

Pharmaceutical Interventions

	Title and Date	Autism Related Objectives	Autism Related Conclusions	DOI
1	**Hyperbaric oxygen therapy for people with autism spectrum disorder (ASD) – 2016**	To determine whether treatment with hyperbaric oxygen 1) improves core symptoms of ASD, including social communication problems and stereotypical and repetitive behaviors 2) improves noncore symptoms of ASD, such as challenging behaviors 3) improves comorbid states, such as depression and anxiety 4) causes adverse effects.	To date, there is no evidence that hyperbaric oxygen therapy improves core or associated symptoms of ASD. It is important to note that adverse effects (minor-grade ear barotrauma events) can occur. Therefore, the need for future RCTs of hyperbaric oxygen therapy must be carefully considered.	https://doi.org/10.1002/14651858.CD010922.pub2
2	**Intravenous secretin for autism spectrum disorders (ASD) – 2012**	To assess whether intravenous secretin improves the core features of ASD, other aspects of behaviour or function such as self-injurious behaviour, and the quality of life of affected individuals and their carers. The possible harms of secretin were also assessed.	There is no evidence that single or multiple dose intravenous secretin is effective and as such currently it should not be recommended or administered as a treatment for ASD. Further research can only be justified if new evidence is of high quality and secretin is shown to have a specified role in neurotransmission.	https://doi.org/10.1002/14651858.CD003495.pub3
3	**Aripiprazole for autism spectrum disorders (ASD) – 2016**	To assess the safety and efficacy of aripiprazole as medication treatment for individuals with ASD	Aripiprazole can be effective as a short-term medication intervention for some behavioural aspects of ASD in children/adolescents. After a short-term medication intervention with aripiprazole, children/adolescents showed less irritability and hyperactivity and fewer stereotypies. However, side effects (such as weight gain, sedation, drooling and tremor) must be considered.	https://doi.org/10.1002/14651858.CD009043.pub3
4	**Risperidone for autism spectrum disorder – 2007**	To determine the efficacy and safety of risperidone for people with autism spectrum disorder	Some evidence of the benefits of risperidone in irritability, repetition and social withdrawal were apparent. These	https://doi.org/10.1002/14651858.CD005040.pub2

			must however be considered against the adverse effects, the most prominent being weight gain.	
5	**Tricyclic antidepressants for autism spectrum disorders (ASD) in children and adolescents – 2012**	To determine if treatment with tricyclic antidepressants 1) improves the core features of autism 2) improves non-core features 3) improves comorbid states e.g. depression/anxiety 4) causes adverse effects	Evidence is limited and conflicting. There is a significant side effect profile associated with these medications and so an informed decision needs to be made if starting them. Further research is required before tricyclic antidepressants can be recommended.	https://doi.org/10.1002/14651858.CD008372.pub2
6	**Selective serotonin reuptake inhibitors (SSRIs) for autism spectrum disorders (ASD) – 2013**	To determine if treatment with an selective serotonin reuptake inhibitor (SSRI) 1) improves the core features of autism 2) improves other non-core aspects of behaviour or function such as self-injurious behaviour 3) improves the quality of life of adults or children and their carers 4) has short- and long-term effects on outcome 5) causes harm	There is no evidence of effect of SSRIs in children and emerging evidence of harm. There is limited evidence of the effectiveness of SSRIs in adults from small studies in which risk of bias is unclear.	https://doi.org/10.1002/14651858.CD004677.pub3
7	**Methylphenidate for children and adolescents with autism spectrum disorder – 2017**	To assess the effects of methylphenidate for symptoms of attention deficit hyperactivity disorder (inattention, impulsivity and hyperactivity) and ASD (impairments in social interaction and communication, and repetitive, restricted or stereotypical behaviours) in children and adolescents aged 6 to 18 years with ASD.	There was no evidence that methylphenidate has a negative impact on the core symptoms of ASD. The use of methylphenidate might improve symptoms of hyperactivity and possibly inattention in children with ASD who are tolerant of the medication, although the quality of this evidence is low. The evidence for adverse events is of very low quality. The minimum clinically important difference needs to be confirmed in children with ASD using outcome scales validated for this population.	https://doi.org/10.1002/14651858.CD011144.pub2

Social and Behavioural Interventions

	Title and Date	Autism Related Objectives	Autism Related Conclusions	DOI
1	**Interventions based on the Theory of Mind cognitive model for autism spectrum disorder (ASD) – 2014**	To review the efficacy of interventions based on the theory of mind model for individuals with ASD	While there is some evidence that theory of mind, or a precursor skill, can be taught to people with ASD, there is little evidence of maintenance of that skill, generalisation to other settings, or developmental effects on related skills. Evidence has been graded of 'very low' or 'low' quality. Further longitudinal designs and larger samples are needed.	https://doi.org/10.1002/14651858.CD008785.pub2
2	**Early intensive behavioural intervention (EIBI) for young children with autism spectrum disorders (ASD) – 2018**	To systematically review the evidence for the effectiveness of early intensive behavioural intervention (EIBI) in increasing functional behaviors and skills, decreasing autism severity, and improving intelligence and communication skills for young children with ASD	There is weak evidence that EIBI may be an effective behavioural treatment for some children with ASD. This is due to small study sizes, high risk of bias and 'low' or 'very low' quality evidence. Additional studies using rigorous research designs are needed to make stronger conclusions.	https://doi.org/10.1002/14651858.CD009260.pub3
3	**Communication interventions for autism spectrum disorder in minimally verbal children – 2018**	To assess the effects of communication interventions for ASD in minimally verbal children	There is limited evidence that verbally based and alternative and augmentative communication interventions improve spoken and non-verbal communication in minimally verbal children with ASD.	https://doi.org/10.1002/14651858.CD012324.pub2
4	**Family therapy for autism spectrum disorders – 2017**	To evaluate the clinical effectiveness and acceptability of family therapy as a treatment to enhance communication or coping for individuals with ASD and their family members	Few studies have examined the effectiveness of family therapy for ASD, and none of these are RCTs. Methodologically robust trials are needed in order to determine whether family therapy is of benefit.	https://doi.org/10.1002/14651858.CD011894.pub2
5	**Social skills groups for people aged 6 to 21 with autism spectrum disorders (ASD) – 2012**	To determine the effectiveness of social skills groups for improving social competence, social communication, and quality of life for people with ASD who are 6 to 21 years of age	There is some evidence that social skills groups can improve social competence for some children and adolescents with ASD. More research is needed to draw more robust conclusions, particularly with respect to improvements in quality of life.	https://doi.org/10.1002/14651858.CD008511.pub2
6	**Parent mediated early intervention for young children with autism spectrum disorders (ASD) – 2013**	To assess the effectiveness of parent-mediated early interventions in terms of the benefits for both children with ASD and their parents and to explore some potential moderators of treatment effect.	The review finds some evidence for the effectiveness of parent-mediated interventions and reinforces the need for more research (with a set of common outcome measures) into early intervention service models that enable parents to contribute skilfully to the treatment of their child with autism. However, evidence of whether such interventions may reduce parent stress is inconclusive.	https://doi.org/10.1002/14651858.CD004690.pub4

7	**Cognitive behavioural therapy for anxiety disorders in children and adolescents - 2015**	To determine the effectiveness of cognitive behavioural therapy (CBT) in managing anxiety in children and adolescents with ASD	A post-hoc analysis has suggested that CBT is effective for children and adolescents with high-functioning ASD. However, more research is needed in this area, including looking in to whether CBT is useful for patients with ASD combined with an intellectual disability, and how CBT can be modified to meet the needs of people with ASD.	https://doi.org/10.1002/14651858.CD004690.pub4

The quality of evidence in the majority of the reviews was found to be of poor quality or inconclusive. Table 2 summarises the quality of the evidence for each review, and also makes clear where there have been warnings issued for harm or side effects.

Table 2- Quality of evidence

Complementary and Alternative Interventions

Evidence Found	- Music therapy for people with autism spectrum disorder – 2014
Poor or Inconclusive Evidence	- Auditory integration training and other sound therapies for autism spectrum disorders (ASD) - 2011 - Acupuncture for autism spectrum disorders (ASD) – 2011 - Combined vitamin B6-magnesium treatment in autism spectrum disorder – 2005 - Omega-3 fatty acids supplementation for autism spectrum disorders (ASD) - 2011 - Chelation for autism spectrum disorder (ASD) - 2015
Warnings of Harm or Side Effects	- Chelation for autism spectrum disorder (ASD) - 2015

Pharmaceutical Interventions

Evidence Found	- Aripiprazole for autism spectrum disorders (ASD) - 2016 - Risperidone for autism spectrum disorder - 2007
Poor or Inconclusive Evidence	-Tricyclic antidepressants for autism spectrum disorders (ASD) in children and adolescents – 2012 - Selective serotonin reuptake inhibitors (SSRIs) for autism spectrum disorders (ASD) - 2013 - Methylphenidate for children and adolescents with autism spectrum disorder - 2017 - Hyperbaric oxygen therapy for people with autism spectrum disorder (ASD) - 2016 - Intravenous secretin for autism spectrum disorders (ASD) - 2012
Warnings of Harm or Side Effects	- Aripiprazole for autism spectrum disorders (ASD) - 2016 - Risperidone for autism spectrum disorder – 2007 - Tricyclic antidepressants for autism spectrum disorders (ASD) in children and adolescents – 2012 - Selective serotonin reuptake inhibitors (SSRIs) for autism spectrum disorders (ASD) - 2013 - Hyperbaric oxygen therapy for people with autism spectrum disorder (ASD) - 2016

Social and Behavioural Interventions

Evidence Found	- Social skills groups for people aged 6 to 21 with autism spectrum disorders (ASD) - 2012 - Parent mediated early intervention for young children with autism spectrum disorders (ASD) – 2013 - Cognitive behavioural therapy for anxiety disorders in children and adolescents - 2015
Poor or Inconclusive Evidence	- Early intensive behavioural intervention (EIBI) for young children with autism spectrum disorders (ASD) - 2018 - Interventions based on the Theory of Mind cognitive model for autism spectrum disorder (ASD) - 2014 - Communication interventions for autism spectrum disorder in minimally verbal children – 2018 - Family therapy for autism spectrum disorders - 2017

Conclusions

Based on the current evidence, few interventions for autism can be recommended.

Music therapy may be helpful, but it is not certain whether its effects are long-lasting. Aripiprazole and risperidone (atypical antipsychotics) show some potential, but have problematic side-effects. Three of the social/behavioural interventions (social skills groups, parent mediated early intervention, and CBT) are thought to provide some benefit, but more research is needed before robust conclusions can be drawn.

A common theme in all the Cochrane reviews was the need for more autism research with improved methodology, larger samples, and longer follow-up.

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The authors are independent of the reviewed research.

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