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An investigation of comorbid psychological disorders, sleep problems, gastrointestinal symptoms and epilepsy in children and adolescents with autism spectrum disorder: A two year follow-up

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ABSTRACT

Research has recently focused on studying comorbidity in the autism spectrum but little research has been conducted on follow-up studies or conducting longitudinal research into these conditions. Mannion, Leader, and Healy (2013) examined the frequency of comorbid disorders in children and adolescents with autism spectrum disorder and the predictors of sleep problems. The current study is a follow-up study conducted two years later with 56 participants. Age, gender, level of intellectual disability, presence of epilepsy, attention deficit/hyperactivity disorder (AD/HD) and an anxiety disorder were assessed, along with administering the Autism Spectrum Disorder-Comorbid for Children (ASD-CC), the Children's Sleep Habits Questionnaire (CSHQ) and Gastrointestinal Symptom Inventory. The aim of the study was to determine if comorbid symptoms changed over time. An additional aim was to explore if there is a relationship between family medical history and history of autoimmune diseases, and child comorbid conditions. Sleep problems persisted in 91.5% of participants. Gastrointestinal symptoms persisted in 84.4% of participants. There was a significant difference between over-eating at baseline and at two-year follow-up, where over-eating became more severe over time. It was found that 92.9% of participants presented with a family history of autoimmune disease. The most common autoimmune diseases were osteoarthritis, psoriasis and hypothyroidism. The associations between familial autoimmune diseases and child comorbid conditions are discussed in the study.
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1. Introduction

1.1. Comorbidity in autism spectrum disorder (ASD)

Comorbidity is defined as the co-occurrence of two or more disorders in the same person (Matson & Nebel-Schwalm, 2007). Recent research has identified the importance of comorbidity research in autism spectrum disorder (ASD) in relation to diagnosis and treatment priorities (Mannion & Leader, 2013b; Matson & Goldin, 2013; Matson & Williams, 2014). Research has identified the range and types of comorbidities from babies and infants (Fodstad, Rojahn, & Matson, 2010; Kozlowski,

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Matson, Belva, & Rieske, 2012), childhood (Matson, Fodstad, & Dempsey, 2009; Mannion, Leader, & Healy, 2013), adolescents (Simonoff et al., 2008) and adults (Davis et al., 2011; LoVullo & Matson, 2009). Research has also investigated the frequency and predictors of comorbidity (Mannion & Leader, 2013a; Mannion et al., 2013). Much more research is needed into many areas of comorbidity in ASD including longitudinal research. Longitudinal research is needed to determine if and how comorbid symptoms change over time in individuals with ASD. Comorbid conditions include comorbid psychopathology, epilepsy, sleep problems and gastrointestinal symptoms. Research is needed to better understand the change in these symptoms as individuals with ASD age.

1.2. Preliminary studies

Mannion et al. (2013) examined the frequency of current comorbid diagnosis, comorbid psychopathology, sleep problems and gastrointestinal symptoms in children and adolescents with ASD. The authors found that 46.1% of children and adolescents with ASD had a comorbid psychological or medical diagnosis. When intellectual disability was included as a potential comorbid diagnosis, 78.7% had a comorbid diagnosis. The prevalence of attention-deficit hyperactivity disorder was 18% and 15.7% of individuals had an anxiety disorder. Mannion et al. (2013) found that the majority (80.9%) of participants presented with sleep problems, while 70.3% of participants presented with gastrointestinal symptoms. As well as investigating the frequency of comorbid conditions, the predictors of sleep problems were examined. Under-eating, avoidant behavior, and total gastrointestinal symptoms predicted sleep problems. Abdominal pain was found to predict sleep anxiety.

Mannion and Leader (2013a) expanded on Mannion et al. (2013) by investigating predictors of comorbid psychopathology and gastrointestinal symptoms. A high prevalence of repetitive behaviors, tantrum behaviors, avoidant behaviors, worry/depressed behaviors, conduct behaviors, and eating problems were found. It was found that sleep disordered breathing and daytime sleepiness predicted abdominal pain and bloating. Sleep anxiety predicted abdominal pain. It was also found that total GI symptoms predicted comorbid psychopathology. Nausea predicted worry/depressed behavior, avoidant behavior and conduct behavior. Abdominal pain and constipation also predicted conduct behavior. Diarrhea predicted tantrum behavior.

1.3. Comorbid psychopathology

Longitudinal research has been conducted investigating children with autism and comorbid psychiatric disorders (Kim, Freeman, Paparella, & Forness, 2012; Mannion, Brahm, & Leader, 2014) and attention-deficit/hyperactivity disorder (AD/HD; Fein, Dixon, Paul, & Levin, 2005). Comorbid psychiatric disorders have been found to be relatively stable over time (Kim et al., 2012). While little research has been conducted with children with ASD, even less is known about comorbid conditions in adolescence and adulthood. Magiati, Tay, and Howlin (2014) conducted a systematic review of longitudinal follow-up studies in adulthood. The review found that 16 out of 25 studies provided some information on comorbid conditions in adulthood. It was found that only one study (Gray et al., 2012) examined change in comorbid symptoms over time. With regards to specific comorbid psychopathology symptoms, research has found anxiety and depression to increase with age (Mayes, Calhoun, Murray, & Zahid, 2011; Vasa et al., 2013). In contrast, research found comorbid psychopathology to not increase with age (Davis et al., 2011; Strang et al., 2012). While Davis et al. (2011) found that anxiety rises from toddlerhood to childhood, it was found that anxiety decreases from childhood to young adulthood and again increases from young adulthood into older adulthood. Research is needed on the age related variations of comorbid psychopathology in the same participants over time.

1.4. Epilepsy

Nordin and Gillberg (1998) recommended that follow-up studies should include clear descriptions of comorbid conditions, and that the long-term effects of the conditions and their possible interactions with each other should be evaluated. Follow-up studies have been conducted in individuals with ASD investigating whether they developed epilepsy (Bolton et al., 2011; Billstedt, Gillberg, & Gillberg, 2005; Hara, 2007). Billstedt et al. (2005) found that new cases of epilepsy appeared in the post-adolescent period, but no individual developed epilepsy after the age of 20 years. Bolton et al. (2011) found that 22% of individuals developed epilepsy. This highlights the importance of following up on the diagnosis of epilepsy in our current study. Mannion et al. (2013) found that 10.1% of children and adolescents with ASD had epilepsy. The current study will allow us to determine if participants had developed an epilepsy diagnosis within the previous two years.

1.5. Sleep problems

Mannion and Leader (2014b) discussed age related variations in sleep problems in ASD in their review, and commented on the need for research to better understand what happens to sleep problems as children age. Goldman, Richdale, Clemons, and Malow (2012) examined younger children, older children and adolescents with ASD. The research found that sleep problems persist throughout the age span from early childhood through adolescence in children with ASD. The study also found that types of sleep problems tend to change with age. Parents of younger children with ASD reported more difficulties with sleep anxiety, bedtime resistance, night wakings, and parasomnias. Parents of adolescents with ASD reported more

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