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# Pattern of Psychiatric Comorbidities in Children with Autistic Spectrum Disorder: An Observational Study at SRVS Medical College, Shivpuri

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**Abstract**

**Introduction:** Autism spectrum disorder (ASD) is a neurodevelopmental condition characterized by deficits in social communication, restricted interests, and repetitive behaviors. These core features, which persist throughout life, can be compounded by additional behavioral and emotional challenges. Individuals with ASD often face a higher prevalence of common mental disorders compared to neurotypical individuals. This significant burden of psychiatric disorders among the ASD population underscores the need for continued research and improvement in diagnostic practices for ASD and its comorbid conditions.

**Methods:** In this cross-sectional study, the aim was to determine the prevalence of psychiatric comorbidities and describe their characteristics in children with ASD. The study included 178 patients diagnosed with ASD, comprising 137 males and 47 females, with a mean age of 7.922 ± 4.15 years.

**Results:** The findings of this study revealed that significant proportion of children with ASD had at least one psychiatric comorbidity. The psychiatric disorders observed in this population sample included attention deficit hyperactivity disorder, conduct disorder, disruptive mood dysregulation disorder, anxiety disorder and insomnia, elimination disorder, and depression.

**Conclusion:** The findings of our study shed light on the complexity of psychiatric comorbidities in children with ASD, emphasizing the importance of comprehensive assessment and tailored interventions to address their unique needs.

## INTRODUCTION

Autism spectrum disorder (ASD) is a neurodevelopmental disorder marked by challenges in social communication, restricted interests, and repetitive behaviors. Global prevalence studies from 2012 indicated a median of 62 cases per 10,000 individuals. ASD, typically identified early in life, persists chronically and impacts not only those affected but also their families, caregivers, and communities [1-3]. Throughout life, the core impairments of ASD may intertwine with behavioral and emotional issues. Previous investigations have highlighted the co-occurrence of ASD with other psychiatric conditions [4-5]. Notably, the recognition of psychiatric comorbidity in ASD has gained prominence post the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) revision, which removed exclusions for additional diagnoses in ASD individuals. Individuals with ASD are at a heightened risk for common mental disorders compared to the general population. Around 70% of ASD individuals experience at least one comorbid psychiatric condition, with nearly 40% encountering two or more such disorders [6,7].

The prevalence of psychiatric comorbidities in ASD has been extensively studied through reviews, meta-analyses, and umbrella reviews. Recent umbrella reviews have reported varying comorbidity prevalence rates among ASD individuals, ranging from 54.8% to

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94%. Discrepancies in prevalence rates across studies can be attributed to population demographics, assessment methodologies, and diagnostic instruments. Notably, adults with ASD exhibit a higher prevalence of psychiatric comorbidities than younger individuals. Furthermore, children with ASD often bear a greater burden of psychiatric comorbidities compared to children with intellectual disabilities. Studies employing smaller sample sizes and newer diagnostic criteria tend to report higher comorbidity rates than those with larger samples and older diagnostic tools [8,9].

The co-occurrence of attention deficit/hyperactivity disorder (ADHD) in ASD ranges from 25.7% to 65%, while disruptive, impulse-control, and conduct disorders range from 12% to 48% [10,11]. Obsessive-compulsive disorder (OCD) prevalence in ASD ranges from 9% to 22%, suicidal ideation from 10.9% to 66%, suicide attempts from 1% to 35%, sleep-wake disorders at 13%, and schizophrenia spectrum disorders from 4% to 67% [12-14]. Mood disorders are reported in ASD populations at rates ranging from 4.4% to 37%, while anxiety disorders range from 1.47% to 54%, and depressive disorders from 2.5% to 47.1% [15,16].

This report presents findings from a cross-sectional study aiming to estimate the prevalence of psychiatric comorbidities and describe their characteristics among children with ASD at SRVS Medical College, Shivpuri, India.

## MATERIALS AND METHODS

This cross-sectional study focused on examining the current psychiatric comorbidities among children diagnosed with autism spectrum disorder (ASD). The study population was sourced from SRVS Medical College, Shivpuri, India. Inclusion criteria encompassed all patients with a confirmed diagnosis of ASD, categorized as autistic disorder, atypical autism, or Asperger syndrome.

The diagnosis of ASD was established through a combination of clinical evaluation and diagnostic assessments using tools such as the Autism Diagnostic Interview–Revised (ADI-R) and Autism Diagnostic Observation Schedule (ADOS), with confirmation documented in the medical records. Diagnoses of the comorbidities were primarily based on clinical examinations, parental interviews, and in some cases, input from teachers or caregivers.

Specifically, attention-deficit-hyperactivity disorder (ADHD) was used instead of hyperkinetic disorder, and disruptive mood dysregulation disorder (DMDD) was diagnosed according to DSM-V criteria. Elimination disorder encompassed both enuresis and encopresis. Various characteristics of the patients, their parents, perinatal factors, instrumental examinations, and pharmacological treatments were assessed where available in the medical records.

Data analysis was conducted using Epi Info software, involving descriptive statistics such as means, standard deviations for continuous variables, and counts/percentages for categorical data. Fisher's test was utilized for odds ratio calculations with a 95% confidence interval.

## RESULTS

Table 1 displays the initial data pertaining to the participants of this study. The study encompassed 178 individuals diagnosed with Autism Spectrum Disorder (ASD), comprising 137 males and 47 females. Their average age was 7.922 years with a standard deviation of 4.15 (Table 1). The mean age of the mothers and fathers of these patients at the time of their children's birth was 31.61 years with a standard deviation of 5.39 and 36.21 years with a standard deviation of 8.11, respectively (Table 2).

In this cross-sectional investigation, the prevalence of at least one comorbid psychiatric disorder among children with ASD was estimated to be 36.67%. Specifically, 17.89% of patients had one comorbid psychiatric disorder, 9.36% had two, 8.89% had three, and 0.72% had four. The observed psychiatric disorders within this participant pool included Attention Deficit Hyperactivity Disorder (ADHD) in 17.98% of patients, conduct disorder in 12.36%, disruptive mood dysregulation disorder in 10.11%, anxiety disorder and insomnia in 7.87%, elimination disorder in 3.37%, and depression in 2.25% (Table 3, Figure 1).

**Table 1: Baseline data of study patients**

| Characteristic | ASD | | ASD with Comorbidity | |
|---|---|---|---|---|
| | n | % | n | % |
| Male | 137 | 76.97 | 47 | 34.31 |
| Female | 41 | 23.03 | 19 | 46.34 |

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| | | | | |
|---|---|---|---|---|
| Mean Age | 7.922 ± 4.15 | | 10.56 ± 4.25 | |
| Apgar Score <7 | 9 | 5.06 | 2 | 22.22 |
| Assisted Reproductive Technology | 6 | 3.37 | 2 | 33.33 |
| Caesarean Section | 70 | 39.33 | 29 | 41.43 |
| Delivery Complications | 26 | 14.61 | 14 | 53.85 |
| IQ > 70 | 25 | 14.04 | 12 | 48.00 |
| Low Birth Weight | 12 | 6.74 | 4 | 33.33 |
| Mother's Medical Disorder | 16 | 8.99 | 7 | 43.75 |
| Mother Taking Medicines | 15 | 8.43 | 6 | 40.00 |
| Postnatal Complications | 9 | 5.06 | 4 | 44.44 |
| Pregnancy Complications | 7 | 3.93 | 4 | 57.14 |
| Preterm Born | 22 | 12.36 | 9 | 40.91 |
| Psychiatric Heredity | 12 | 6.74 | 2 | 16.67 |
| Twins | 10 | 5.62 | 0 | 0.00 |

**Table 2: Parental age analysis in study cases**

| **Parental Age** | **ASD** | | **ASD with Comorbidity** | |
|---|---|---|---|---|
| | **n** | **%** | **n** | **%** |
| Mother's Age | 31.61 ± 5.39 | | 31.21 ± 4.54 | |
| <30 years | 77 | 43.26 | 29 | 37.66 |
| 30–35 years | 67 | 37.64 | 29 | 43.28 |
| 36–40 years | 26 | 14.61 | 7 | 26.92 |
| >40 years | 8 | 4.49 | 0 | 0.00 |
| Father's Age | 36.21 ± 8.11 | | 36.61 ± 4.55 | |
| <30 years | 29 | 16.29 | 9 | 31.03 |
| 30–35 years | 83 | 46.63 | 29 | 34.94 |
| 36–40 years | 29 | 16.29 | 9 | 31.03 |
| >40 years | 36 | 20.22 | 17 | 47.22 |

**Table 3: Prevalence of comorbidity in ASD study population**

| **Comorbidity Disorders** | **n** | **%** |
|---|---|---|
| ADHD | 32 | 17.98 |
| Aggressive (Conduct) Disorder | 22 | 12.36 |
| Disruptive Mood Dysregulation Disorder | 18 | 10.11 |
| Anxiety Disorder | 14 | 7.87 |
| Insomnia | 14 | 7.87 |
| Elimination Disorder | 6 | 3.37 |
| Enuresis/Encopresis | 6 | 3.37 |
| Depression | 4 | 2.25 |

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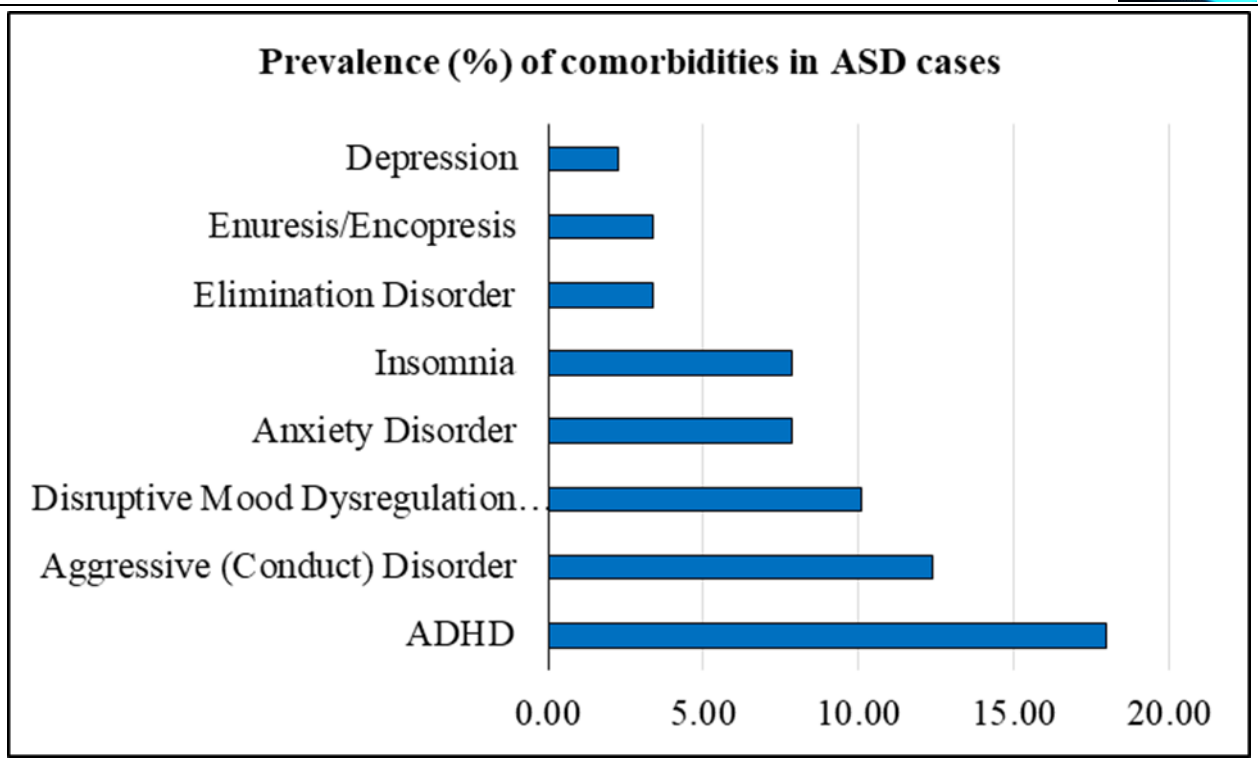


**Figure 1: Prevalence % of comorbidities in ASD study population**

**DISCUSSION**

Autism spectrum disorder (ASD) and attention deficit hyperactivity disorder (ADHD) are extensively studied neurodevelopmental disorders. Their symptoms frequently overlap, featuring difficulties in attention, peer communication, impulsivity, and varying degrees of restlessness or hyperactivity. Moreover, both are more prevalent in boys than girls and are typically noticeable during the preschool years. Genetic predisposition is presumed for both disorders. Over the past decades, numerous studies have reported an increased prevalence of ADHD and ASD. Additionally, between 30% and 50% of individuals with ASD exhibit ADHD symptoms. The introduction of changes in DSM-V allowing for ADHD/ASD comorbidity led to an increase in studies, with recent results indicating a comorbidity prevalence of 25.7% to 65%. The prevalence of children with both ASD and ADHD in this study is 17.98%. ADHD is also commonly associated with disruptive behavior disorders (oppositional defiant disorder and conduct disorder). This study also identifies a significant association between ADHD patients and conduct disorder. As suggested by literature, epilepsy is frequent in ADHD patients (23–40%). In the sample, five patients had diagnosed epilepsy, while eight exhibited epileptiform activity without clinical seizure manifestations. Frontostriatal circuit abnormalities have often been implicated in ADHD, and imaging studies have supported the presence of such abnormalities in individuals with ADHD. 2 patients in the sample had frontal lobe abnormalities, although not all patients underwent MRI examinations. Furthermore, this research highlights some risk factors such as preterm birth and low birth weight found in three and one patient, respectively, although data were not adjusted and were unavailable for every patient. This aspect will be a focus of future research [17-20].

In one systematic review, conduct disorders were found in 12% of ASD patients, similar to our findings where conduct disorder was present in 13.10% of patients [11]. Notably, this brief report found that six of 22 patients with conduct disorder also had ADHD. It is assumed that these patients experience a more pronounced impact on quality of life regarding social relationships. The primary domains of ASD encompass socialization impairment, communication difficulties, and behavioral issues, whereas conduct disorder involves breaching social norms through aggression and misinterpretation, potentially explaining this comorbidity. Disruptive mood dysregulation disorder (DMDD) is characterized by extreme irritability, anger, and frequent, intense

temper outbursts [3]. This brief report identified 18 patients (10.11%) with this disorder. In one study of 582 children with autism, 45.2% frequently exhibited DMDD symptoms [21]. These findings advocate for further research not only into the presence of DMDD in the ASD population but also into enhancing diagnostic tools and screening for DMDD symptoms in clinical practice.

Anxiety disorders were evaluated among 2,121 children and adolescents with ASD in a meta-analytic review, revealing a prevalence of 39.6% and 34.8% in fixed and random effects models, respectively [22]. Another meta-analysis found a 20% comorbidity rate of anxiety disorders in ASD [11]. Anxiety is a common comorbidity in children with recent-onset epilepsy and structural brain abnormalities [23]. This brief report identified 14 patients (7.87%) with anxiety disorder and ASD, which is lower than the percentages reported in meta-analyses. One patient exhibited cortical brain abnormalities, although this patient also had epilepsy and ADHD. The patients with anxiety disorder identified in this study also had comorbid psychiatric disorders, warranting further investigation into possible risk factor correlations, a focus of future research in this ongoing study.

It is estimated that 40–80% of individuals with ASD experience co-occurring sleep disturbances. Insomnia is reported to be ten times more frequent in children with ASD compared to those without. This study observed the presence of insomnia disorder in 14 patients (7.87%) with ASD. While there is limited research on elimination disorders in children with ASD, study results suggest a higher prevalence of incontinence in these children compared to typically developing children. Overall rates of incontinence ranged from 9.3% to 57% across four studies. The study identified 6 patients (3.37%) with ASD and elimination disorder. Depression is not uncommon among youth, affecting around 12% of adolescents in the general population. Despite challenges in recognizing depression in children and adolescents with ASD due to communication deficits, a study of 101 children with ASD aged 4 to 9 years found a prevalence of depression ranging from 6% (IQ < 70) to 19% (IQ ≥ 70) (43). This study identified depression in 4 patients (2.25%), all of whom were receiving pharmacological treatment [24-26].

Notably, this research did not identify psychiatric disorders such as schizophrenia spectrum and psychotic disorders, bipolar disorder, obsessive-compulsive disorder, suicide attempts, ideation, or completions. Possible reasons for this include the aforementioned limitations of the study, including its small sample size, observational nature, and reliance on medical records. Future follow-up and the collection of missing data are crucial aspects of this ongoing study, along with analyzing the correlation of risk factors.

## CONCLUSION

This research aims to provide insights into the experience of psychiatric comorbidities among the autism spectrum disorder (ASD) population at an Indian medical hospital. The institute aspires to deliver high-quality healthcare services to its patients. Improving diagnostic assessments for various symptomatology patterns is crucial for enhancing treatment outcomes. Hence, investigating psychiatric comorbidities in children with ASD holds significant importance for us.

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