

# Prevalence of ASD–Autism Spectrum Disorder in the Rural Area of Wardha District, Maharashtra

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## Abstract

**Background:** ASD is a spectrum of ailments owing to the developmental issues in the nervous system that is represented by lack of social communication and the occurrence of behavioral repetition and restricted interests. Evidence-based prevalence of disorders such as Autism, disintegrative disorder in childhood, Asperger Syndrome etc., in the general population in India is not yet predicted and not many studies are been conducted to estimate Autism prevalence among people in rural areas of India. **Objectives:** To find out the prevalence of ASD in the rural part of Wardha district, Maharashtra. **Methodology:** We will do the prospective study in which children will be screened by fifth revised criteria for detection of autism-DSM 5. **Result:** By doing this study, we will come to know the actual prevalence of ASD and risk factors for ASD in rural area of Wardha district. **Conclusion:** Depending on the prevalence of the autism, we will be planned for setting up a set of clinical guiding principles for the management of autism at the primary health centres.

## Keywords

Prevalence; Autism Spectrum Disorder (ASD); Rural India

## Introduction

Autism Spectrum Disorder (ASD) is a complex condition owing to human nervous system development which causes significant deterioration in cognitive, emotive, and social abilities like speaking, listening, intercommunicating, interrelating, acquainting, intellectuality, reasoning, creativity, analysing, free-associating, etc. and also contributes to certain unusual behavioral patterns.

Generally, these impairments can be noticed in early childhood (before 3 years of age) itself. Early milestones including social smile, language learning, physical and emotional responses are not reached at the appropriate timeline. These complaints will persist throughout life and cast a disadvantageous influence on the welfare of those with ASD. [1,2]

Autism Spectrum Disorder (ASD) includes both Autism and Asperger Syndrome.

This spectrum of Autism covers diverse types of neurodevelopmental disorders with discrete and varying symptoms. DSM-5 has grouped disorders such as childhood disintegrative and autistic disorders, Pervasive Developmental Disorder (PDD-NOS), and Asperger Syndrome under one spectrum called as Autism spectrum disorder. Typically, symptoms are noticeable below two years

of age in kids with ASD. However, a countless number of offspring are not diagnosed clinically until they are older due to several reasons. In few cases, diagnosis is received as adolescents also. Individuals with mild symptoms will be able to function independently with few difficulties generally.

Whereas, as the symptoms are stronger, need for significant support may also arise. Sometimes, an individual with severe symptoms of ASD, cannot be able to manage one's own day to day activities, relationships and can also have hypersensitivity issues. One may also find it difficult to hold articles properly and to perform any given task with minimal efficiency. A contemporary statistical analysis of results of 37 studies on the prevalence of autism predicted that at least 7.1 per 10,000 individuals under the age group of 18 years are having autism characteristics. [3] Other than that, there is rarely any statistical information about the autism prevalence in the children in rural areas of India. Furthermore, due to a lack of knowledge and information regarding autism among health professionals and the general population, the diagnosis of autism is frequently missed. [4] Hence, there comes an emphasis on the

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need to know the ASD prevalence in the rural areas of Wardha district.

## Aims & Objectives

### Aim

Prevalence of ASD in the in the Rural Area of Wardha District, Maharashtra.

### Objectives

- To know the risk factor for ASD.
- To figure out the association of ASD and Serum lead level.

## Methodology

**Study design:** It is a prospective, observational, and cross-sectional prevalence study.

**Setting:** This study will be conducted in Anganwadi or play school in the rural area of Wardha districts, Maharashtra.

**Duration:** One year.

### Inclusion criteria

- Age group: 18-60 month
- Essentially parents need to be prepared to accept an assessment of their offspring which may include psychiatric consultation and neurological investigation.

### Exclusion criteria

- Existence of impairing psychiatric or medical illnesses.
- Lack of proper consent.

### Diagnostic criteria for evaluation of ASD

Must meet all three behavioural criteria in category A and at least two in category B, according to DSM V revised criteria for ASD. [5,6]

**Category A:** Deficits or lack of Social Communication and Interaction.

Anomalies and inconsistencies in social and emotional interactions.

Unusual eye contact, facial expression, and physical responses, which including gesture during verbal and non-verbal communication.

In society, there is irrational behaviour and a problem in correlating with one another.

**Category B:** Distinctive, limited, and recurring behaviour patterns:

Motor and speech patterns that are stereotyped.

Verbal and nonverbal procedures that have become ritualised.

Obsessive abilities and interests.

Hyper or hypo activity.

**Category C:** symptoms must appear in early childhood.

**Category D:** These symptoms combine to limit and affect daily functioning.

A pre-structured questionnaire will be given to the parent to assess the development and risk factors which may or may not be contributing to the ASD like age and gender of the child, age of the mother, activity of the child, socio-economic status, type of family etc. The information will be collected from the mother of the child. We will assess the child for ASD according to DSM -5 criteria for ASD. If the child will be diagnosed as case of ASD then we assess the serum lead level and arbitrate that child with speech therapy. We will also see the progress of the autistic child after 3months, 6 months and 12 months. The previously identified villages which are within the reach of AVBRH, Sawangi Meghe, Wardha that is within the area of 50 km will be part of the study.

### Sample size calculation

- Population size(N):1000000
- Estimated %frequency of outcome factor in the population(p):30% ± 5
- Confidence limit as% of 100(d):5%
- Design effect (for cluster surveys-DEFF):1
- Confidence level:95%
- Sample size formula

$$N = \left[ \frac{DEFF * Np(1-p)}{\left[ \left( \frac{d^2}{z^2} - \alpha * (N-1) + p*(1-p) \right) \right]} \right]$$

## Statistical Analysis

Statistical analysis will be done by using stat Version 10. Clinical characteristics of Autism children will be compared with no Autism Children Characteristics. Descriptive analysis of age, sex, and risk factors of the ASD will be performed. Chi- square test will be used where appropriate. The means of all the continuous variables will be compared between the two groups using the two-sample Student's t-test. A p<0.05 will be considered statistically significant.

## Result

By doing this study, we will know the actual prevalence of ASD and risk factors for ASD in rural area of Wardha district. We will find out the prevalence of ASD, according to gender. We will also analyze the Developmental Quotient (DQ) in different age group of the children. We will study the correlation between the ASD and serum lead level.

## Discussion

The etiology of ASD conditions is uncertain till today but studies propose that a significant role is played by genetics in conferring susceptibility. Major risk factors for ASD ranges typically from having parents of older ages, autism history

within the family line, and genetics certainly. ASDs are stimulated by a combination of ecological and genetic factors, and they are frequently linked to personal suffering and the burden of care on families. [1] It usually occurs in infancy. Most of the ASD children presented with difficulties in understanding the language and behavioural problems. Enormous number of parents complains about the abnormal behavioural like mutism, lack of expressive emotion or echolalia. [7,8] The most common neurobehavioral disorder of childhood is Attention Deficit Hyperactivity Disorders (ADHD), affecting school aged children, and the most widely studied childhood mental disorder. [9] Mixing up languages, difficulties in social, emotional, and behavioral skills, a lapse in language, and missing baby milestones are important early red flags of the disorder. Autism is determined by investigating a child's specific behaviors in contrast to the Mental Disorders-V Revised Criteria given by Diagnostic Statistical Manual (DSM). An increase in the availability of diagnostic services, treatment facilities, and professionals trained in childhood development disorders has greatly increased the capacity of the health care system to identify and treat ASD children at younger ages. A study has evaluated ratio of autism spectrum disorders in male children to that of female children to be 4.2:1. Which is for every 70 boys, on an average at least a boy may be autistic and in case of females it is one in every 315 girls. These ratios can be due to noticeable symptoms are more in boys than to girls and hence diagnosis is more often received by boys than female children. In any case, autism is a global syndrome. And there is 'no cure' for ASD owing to the reason that brain structures evolve in utero and cannot be modified as required by interventions at any stage of life after birth. There are many movements across the world which promotes ASD as a special diversity of nervous system and mentions it as a natural variation of brain structure rather than a disorder. As per the ADDM Network of the Centers for Disease Control Prevention (CDC), one out of every 68 children have ASD. [10] From the same CDC's established ADDM Network, across all eleven sites. ASD was reported to have a prevalence of 18.5 per 1000 people, it is one in 54 children aged eight years. [11] In 2014, CDC released data that the prevalence of autism is 1.7% of four-year-old children (one in 59) in six communities across the United States. [12] The study done by Williams et al. [13] found universal ASD prevalence of 20 per 10,000 population. From another study conducted by Elsabbagh et al. [14] the prevalence of ASD is 62 cases per 10,000 persons, or one child out of 160. Research which was carried out by Baxter et al. [15] mentioned the prevalence of 7.6 per 1000 which is one in 132 persons worldwide. The systematic review done by Sun X et al. [16] in six Asian countries excluding South Asian countries recorded that the frequency of ASD between 1980 to the present day was 14.8 per 10,000 people. Prevalence rates of ASD around the world estimated are different from various systematic reviews. Since 2000, epidemiological surveys in various geographic locations have indicated an estimate of 17 of 10,000 autistic complaints and 62 of 10,000 all-pervasive developmental problems. Chauhan A et al. [17] carried out the

systematic review and meta-analysis on the prevalence of ASD in India based on community. They found the prevalence of ASD in rural setting was 0.11 in the age group of 1 year-18years and in urban area it was 0.09 in the age group of 0 year-15years. They also highlighted that the prevalence of the ASD in the India is low as compared to another international published literature. It takes an essential requirement for large-scale population-based epidemiological surveys that will aid in determining the precise burden of ASD in our country. But in India, whose medical programs aim for providing survival-based aid, has an extraordinarily little or negligible amount of attention paid for surveillance of developmental debilities at the policy-making as well as at the execution stage. As a result of the aforementioned reason, budgetary apportionments and human resource arrangement are diverted from these activities. Service delivery for these children is a major challenge due to the lack of an efficient identification and referral programme. [18] Overall, at the end of discussion, it is evident that ASD is a spectrum of various neurodevelopmental complications which require individualized attention and support aided by timely clinical diagnosis and social awareness. In the present study, we will thoroughly and methodically review the prevalence of ASD in rural area and identifies breach in our current knowledge base.

## Conclusion

This study is directed towards providing data on the prevalence of ASD which will help professionals in health care sector in lining up suitable research activities and services in rural area.

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