# Caries Prevalence in Rural Patient Population with Autism Spectrum Disorder

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## INTRODUCTION

Autism Spectrum Disorder (ASD) encompasses autistic disorder, Asperger's disorder, and pervasive developmental disorder not otherwise specified. It is part of the neurodevelopmental spectrum which also includes attention deficit hyperactivity disorder and learning disability. ASD is seen in 1/44 US children and is 4.2x more prevalent in boys.

There are conflicting reports in the literature regarding the incidence of dental caries in this population.

This is a retrospective study to evaluate the incidence of dental caries in a rural patient population.

## OBJECTIVES

Examine the incidence of caries in patients diagnosed with ASD as compared to a control group of neurodevelopmentally typical individuals.

## METHODS

Chart review of dental clinic records from Geisinger Health System from the electronic health records and radiographs

- Inclusion criteria: 6–21-year-old patients at Geisinger
- Sample: 75 patients with ASD and 75 neurotypical individuals
- AAPD Caries-Risk Assessment Tool used to associate oral hygiene habits, plaque scores, and diet for comparative analysis
- Caries experience measured using Decayed Missing Filled Teeth (DMFT) score for permanent teeth and dmft for primary teeth
- Statistics:
  - Continuous variables summarized using mean with standard deviation
  - Categorical variables summarized using frequency and percentages
  - Two sample t-test was utilized to compare difference in numbers of decayed, missing, and filled teeth between ASD and control group
  - Statistical analysis using SAS® Enterprise Guide 8.2: User's Guide (SAS Institute Inc., Cary, NC, USA)
  - All tests were 2-sided and p values <0.05 were considered significantly significant

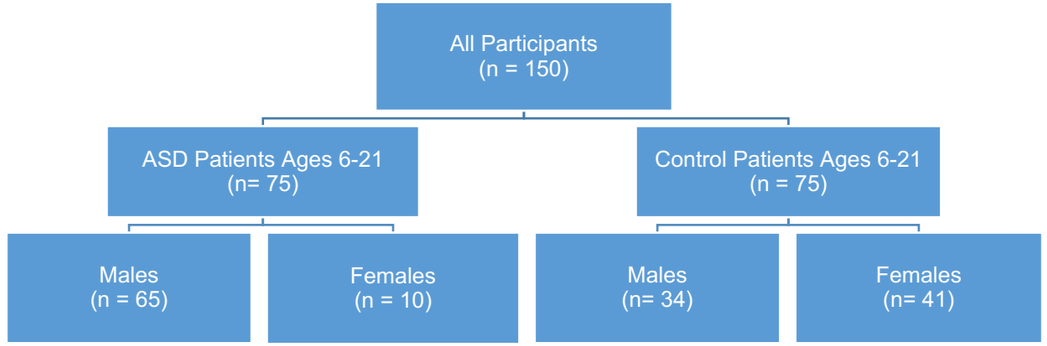



Table 1. Comparison in primary teeth

| | Autism (N=75) | Control (N=75) | Total (N=150) | *P-value* |
|---|---|---|---|---|
| **Decayed Teeth** | | | | *0.5627*[1] |
| Mean (SD) | 0.6 (1.87) | 0.4 (1.14) | 0.5 (1.54) | |
| **Missing Teeth** | | | | *0.2554*[1] |
| Mean (SD) | 1.6 (2.25) | 1.2 (2.04) | 1.4 (2.15) | |
| **Filled Teeth** | | | | *0.2956*[1] |
| Mean (SD) | 3.8 (4.01) | 3.2 (3.26) | 3.5 (3.66) | |
| **DMFT Score** | | | | *0.1368*[1] |
| Mean (SD) | 6.0 (5.26) | 4.8 (4.30) | 5.4 (4.82) | |

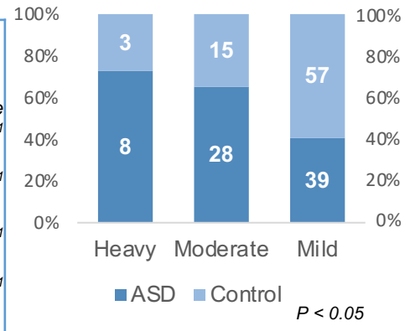
[1]Two sample t-test;

Table 2. Comparison in permanent teeth

| | Autism (N=75) | Control (N=75) | Total (N=150) | *P-value* |
|---|---|---|---|---|
| **Decayed Teeth** | | | | *0.9287*[1] |
| Mean (SD) | 0.6 (1.87) | 0.6 (1.77) | 0.6 (1.82) | |
| **Missing Teeth** | | | | *0.1566*[1] |
| Mean (SD) | 0.2 (1.30) | 0.0 (0.00) | 0.1 (0.92) | |
| **Filled Teeth** | | | | *0.1082*[1] |
| Mean (SD) | 1.6 (2.93) | 1.0 (1.49) | 1.3 (2.34) | |
| **DMFT Score** | | | | *0.1370*[1] |
| Mean (SD) | 2.5 (4.52) | 1.6 (2.35) | 2.0 (3.62) | |

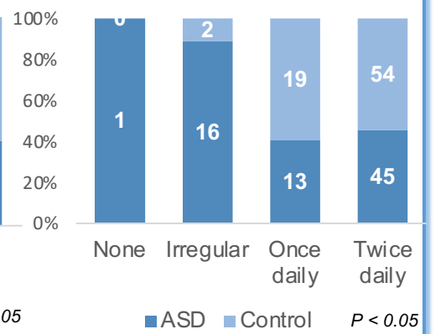
[1]Two sample t-test;

**PLAQUE**



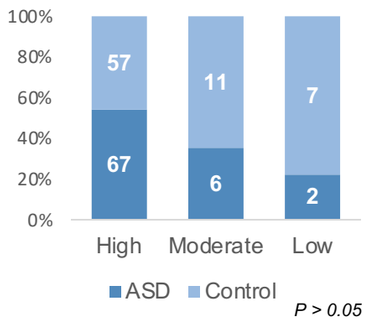

*P < 0.05*

**FREQUENCY OF BRUSHING**



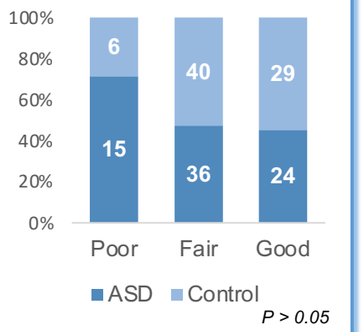

*P < 0.05*

**CARIES RISK**




*P > 0.05*

**ORAL HYGIENE**




*P > 0.05*

## CONCLUSION

Near 90% of the ASD population was classified as high risk based on current caries risk management guidelines.

- Patients with ASD are often categorized in the high caries risk group due to:
  - xerostomia associated with medications
  - diet rich in carbohydrates
  - need for external help with home-care routine
- Interesting to note that primary teeth had higher DMFT scores than permanent teeth which could be due to:
  - thinner enamel of primary teeth versus permanent teeth
  - related to the amount of time the teeth were erupted in the oral cavity
  - a result of changes in the diet and oral hygiene habits of subjects occurrent between childhood and adolescence

Neurotypical patients presented with similar caries risks associations and caries incidences. Correlation could be related to similarities in socioeconomic, regional, and other lifestyle factors.

## REFERENCES

1. Rosen NE, Lord C, Volkmar FR. The diagnosis of autism: From kanner to DSM-III to DSM-5 and beyond. *J Autism Dev Disord*. 2021;51(12):4253-4270.
2. Maenner MJ, Shaw KA, Bakian AV, et al. Prevalence and characteristics of autism spectrum disorder among children aged 8 years - autism and developmental disabilities monitoring network, 11 sites, united states, 2018. *MMWR Surveill Summ*. 2021;70(11):1-16.
3.American Academy of Pediatric Dentistry. Caries-risk assessment and management for infants, children, and adolescents. Pediatr Dent 2019: 252-257.
4. Marshall J, Sheller B, Mancl L. Caries-risk assessment and caries status of children with autism. *Pediatr Dent*. 2010;32(1):69-75.
5. Zhang Y, Lin L, Liu J, Shi L, Lu J. Dental caries status in autistic children: A meta-analysis. *J Autism Dev Disord*. 2020;50(4):1249-1257.
6. Gandhi RP, Klein U. Autism spectrum disorders: An update on oral health management. *J Evid Based Dent Pract*. 2014;14 Suppl:115-126.
7. Ferrazzano GF, Salerno C, Bravaccio C, Ingenito A, Sangianantoni G, Cantile T. Autism spectrum disorders and oral health status: Review of the literature. *Eur J Paediatr Dent*. 2020;21(1):9-12.
8. Loo CY, Graham RM, Hughes CV. The caries experience and behavior of dental patients with autism spectrum disorder. *J Am Dent Assoc*. 2008;139(11):1518-1524.