Autism Spectrum Disorder Impacts Etiology, Incidence, and Management in Pediatric Facial Trauma Patients

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Introduction

Pediatric facial fractures are common and vary greatly between unique subgroups. Patients with Autism Spectrum Disorder (ASD) are at increased risk for sustaining these injuries. However, this population is understudied and injuries in this subgroup are poorly characterized.
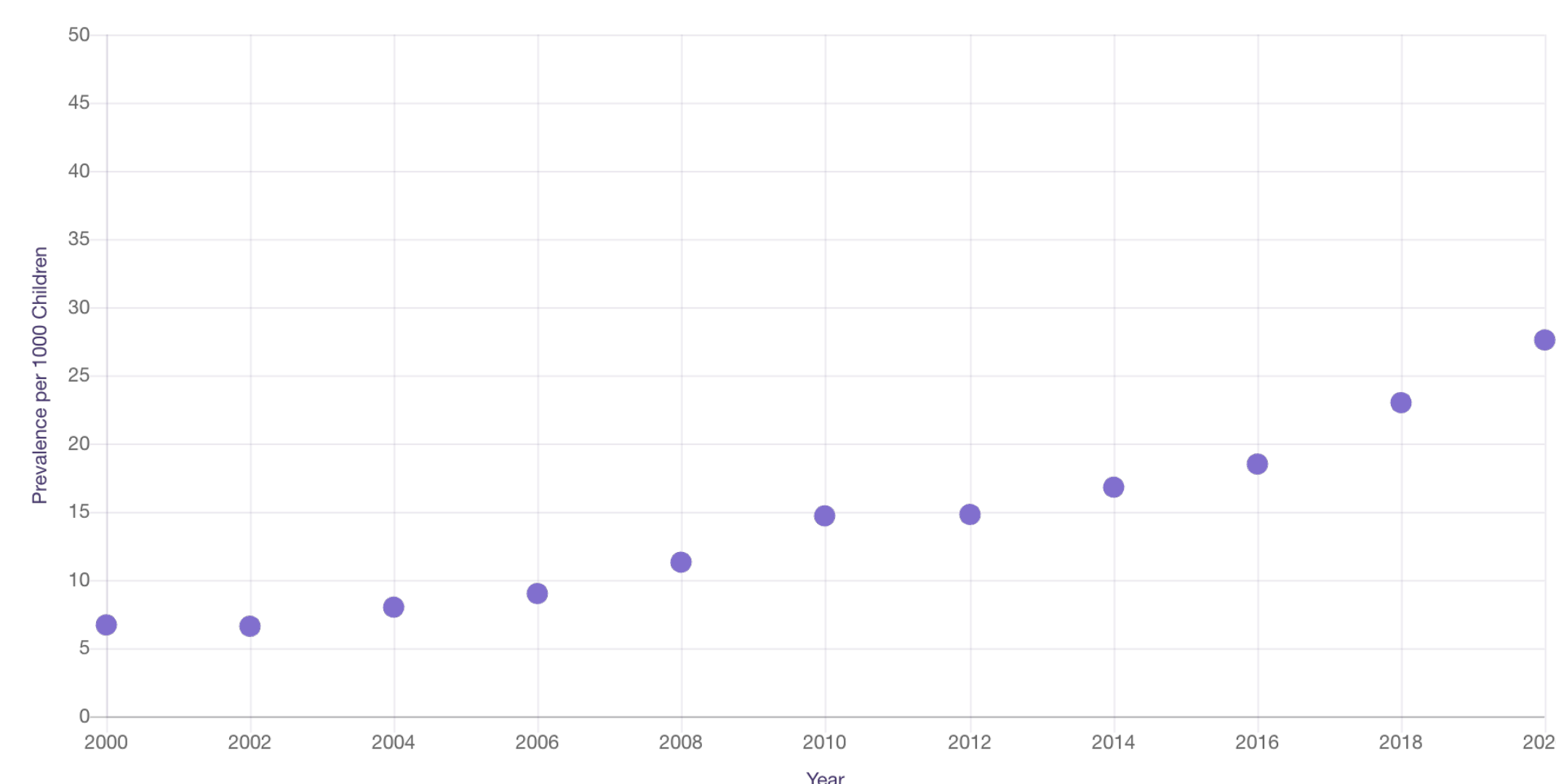
Increasing ASD prevalence from 2000 – 2020[1]. About 1 in 36 children have ASD, underscoring the importance of studying pediatric facial trauma in this large subgroup.

Our study aims to present demographic, diagnostic, and treatment data for pediatric facial fracture patients with ASD.

Methods

We retrospectively reviewed 3334 patients under 18 years of age who were evaluated for facial fractures at UPMC Children's from 2006 to 2021.

Patients who presented with an existing diagnosis of ASD were compared to patients without ASD.

Results

A. Patient demographics of ASD disorder patients with facial fractures (n = 30)

Variable		N (%)
Age (years), mean (SD)		12.0 (4.8)
Age group	Under 6 years	5 (16.7)
	From 6 to 12	11 (36.7)
	Over 12 years	14 (46.7)
Sex	Male	28 (93.3)
	Female	2 (6.7)
Race	White	27 (90.0)
	Black	3 (10.0)
Psychiatric comorbidities	ADHD	11 (36.7)
	Asperger's	2 (6.7)
	Intellectual disability	2 (6.7)
	Bipolar disorder	2 (6.7)
	Generalized anxiety	1 (3.3)
	Panic disorder	1 (3.3)
	Global developmental delay	1 (3.3)
	Self-injurious behavior	1 (3.3)
Medical comorbidities	Neurologic disorder	12 (40.0)
	Seizure disorder	4 (13.3)
	Cardiac malformity	5 (16.7)
	Asthma	3 (10.0)
	Chromosomal abnormality	1 (3.3)
	GERD	1 (3.3)
	Hemophilia A	1 (3.3)
	Notched alveolus	1 (3.3)
	Cleft lip	1 (3.3)
	Neonatal abstinence syndrome	1 (3.3)
	Concussion	1 (3.3)
	Chronic epistaxis	1 (3.3)
Past surgical history		7 (23.3)

SD, standard deviation; ADHD, Attention deficit/hyperactivity disorder; GERD, Gastroesophageal reflux disease

B. Causes of injury in patients with ASD and controls
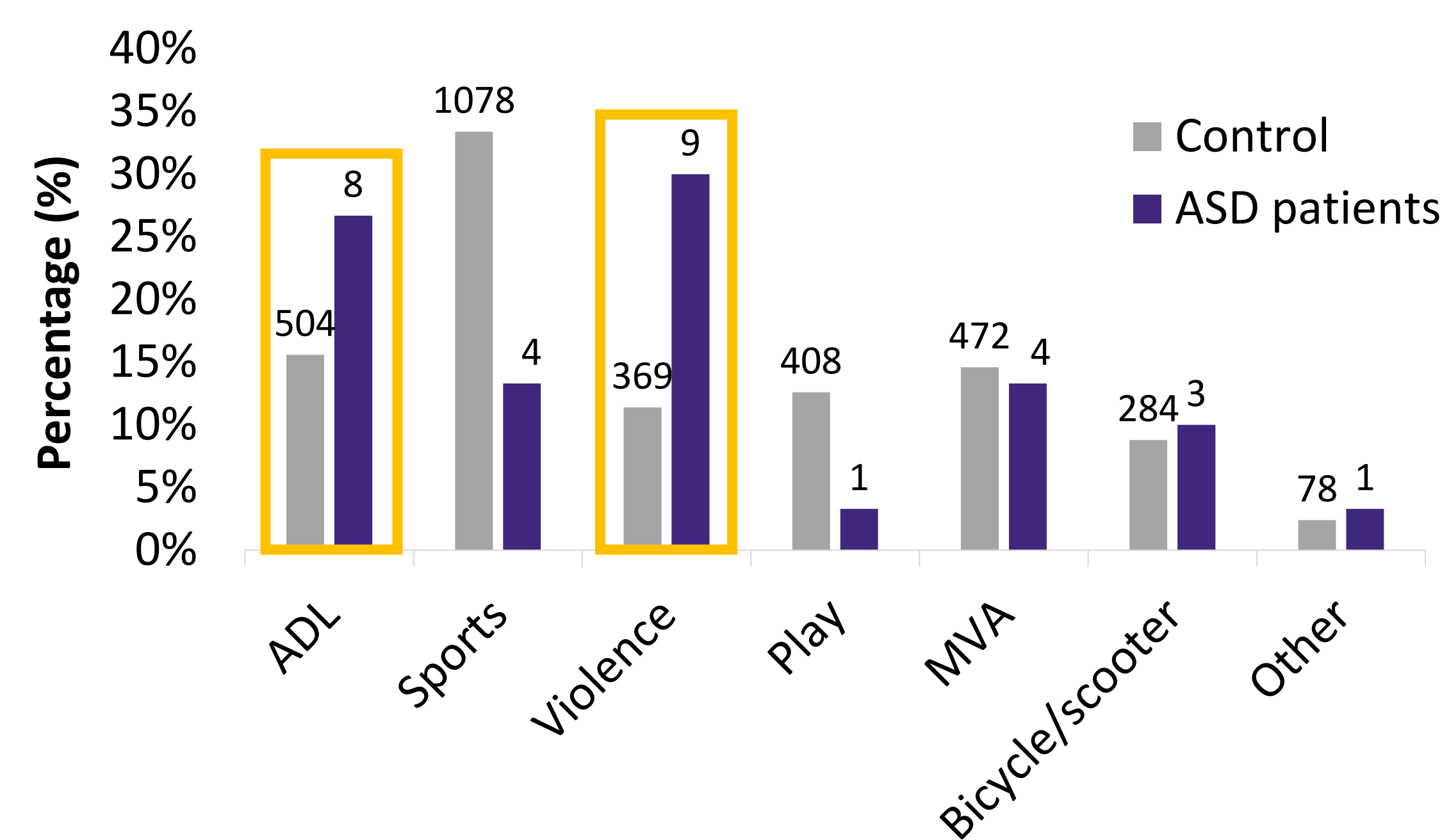
ADL, activities of daily living; MVA, motor vehicle accident

C. Facial fracture patterns in patients with ASD and controls

	Control	ASD patients			
	N (%)	N (%)	P - value	OR	95% CI
Skull	310 (9.4)	0	-	-	-
Orbital	865 (26.2)	3 (10.0)	**0.034**	0.3	0.1 - 0.9
NOE	102 (3.1)	0	-	-	-
Maxilla	609 (18.4)	7 (23.3)	0.643	1.2	0.5 - 2.9
ZMC	98 (3.0)	0	-	-	-
Nasal	2076 (62.8)	23 (76.7)	0.064	2.2	1.0 - 5.3
Mandibular	531 (16.1)	1 (3.3)	0.081	0.2	0.0 - 1.2

NOE, naso-orbitoethmoid; ZMC, zygomaticomaxillary complex; OR, odds ratio; CI, confidence interval

D. Trauma levels, admission, and operative rates in ASD and control patients

		Control	ASD patients			
		N (%)	N (%)	P-value	OR	95% CI
Trauma level	1	158 (6.6)	0	0.401		
	2	619 (25.7)	7 (26.9)			
	3	1633 (67.8)	19 (73.1)			
Admission		1073 (32.5)	7 (23.3)	0.276	0.6	0.3 - 1.5
Operative rate		1604 (48.5)	8 (26.7)	**0.020**	0.4	0.2 - 0.9

A. Average age of ASD patients was 12.0 ± 4.8 years. Most were male (n = 28, 93.3%) and white (n = 27, 90.0%). Many patients had comorbidities such as ADHD (n = 11, 36.7%) or a neurological disorder (n = 12, 40.0%).

B. ASD patients were more likely to present due to violence (OR, 3.0; CI 95%, 1.6- 3.7; p < 0.001) and activities of daily living (OR, 2.2; CI 95% 1.8 - 3.3; p < 0.001) than controls.

C. Nasal fracture was the most common fracture (n = 23, 77.6%). ASD patients were significantly less likely to present with orbital fractures than controls (OR, 0.3; CI 95% 0.1 – 0.9; p = 0.034).

D. Despite no difference in admission rates, the odds of receiving operative treatment were lower in patients with ASD than controls (OR, 0.4; CI 95%, 0.2-0.8, p = 0.020).

Discussion

Our study describes the unique characteristics of pediatric facial fractures in 30 ASD patients, representing 0.9% of a total 3334 cases. The average age of these patients was 12.0 years, with a majority being male and white. We found similar fracture patterns and admission rates in ASD patients compared to controls. However, ASD patients were more likely to be injured secondary violent mechanisms and were less likely to receive operative treatment for similar fractures than patients without ASD. We posit that this discrepancy in surgical management may be due to a hesitation to expose ASD patients to anesthesia owing to the high rate of medical comorbidities in this subgroup [2, 3].

Conclusion

To our knowledge, this is the first study to report differences in incidence, mechanism, fracture pattern, and clinical outcomes of facial fracture among children with ASD. Ultimately, these findings provide useful guidance to clinicians involved in injury care for children with ASD.

References

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