

ABSTRACT

Purpose: To evaluate the trends of incidence in traumatic dental injuries (TDIs) in the pediatric population at a Level I trauma hospital in Houston, TX.
Methods: Pediatric patients under the age of 15 presenting to Memorial Hermann Hospital Pediatric Emergency Department from 2015-2022 were evaluated for trends in different parameters (age, gender, race, date, time of year, teeth affected, mechanism and type of injury) associated with their dental trauma. Data was extracted from the hospital trauma database. P values < 0.05 were statistically significant.
Results: A total of 179 unique cases were evaluated resulting in 381 TDIs. The incidence of injuries for males vs females was 1.2:1. Falls were the most common mechanism of injury in both genders (55.3% of all injuries, P = 0.002097). Males sustained 100% of the injuries related to sports, 69.2% of injuries related to bikes, and 77.8% of injuries related to assault (P = 0.002097). Lateral luxations were associated with primary dentition. In the 12-15 year old age group, alveolar/jaw fractures comprised 36.8% of all injuries (P = 0.01066). In the Summer, 33.3% injuries were alveolar/jaw fractures and in the Spring, 27.1% injuries were alveolar/jaw fractures (P = 0.007653). Out of the 10 cases involving posterior teeth, 40% of those cases had alveolar/jaw fractures (P = 0.003577). Of the 21 cases involving mandibular teeth, 52.4% of those cases had alveolar/jaw fractures (P = 0.007658). There was no association between type of injury and race, ethnicity, gender and injury time.
Conclusions: Current trends in TDIs are useful for practitioners to incorporate into anticipatory guidance to implement prevention strategies to decrease the incidence of TDIs. Additional interprofessional collaborations with emergency medical services are required to improve diagnostic documentation and elucidate TDI epidemiology.

BACKGROUND

- TDIs comprise 5% of all traumatic injuries in people seeking emergency care.² Among preschool children, dental trauma comprises up to 17% of all injuries.¹
- TDIs can be due to a variety of causes including falls, sports, motor vehicle accidents, violence and other reasons. Trends in dental trauma will differ depending on the demographics, location and size of populations studied.
- Different types of TDIs include concussions, subluxations, intrusive luxations, lateral luxations, extrusive luxations, uncomplicated and complicated fractures, and alveolar/jaw fractures.⁴
- Studies have concluded:
 - Males sustain more TDIs than females at a ratio ranging from 1.3:1 to 2.5:1 respectively.³
 - Falls are the most common cause of traumatic dental injuries.³
 - Displacement (luxation) injuries are the most common type of injury in the primary dentition.³
 - Uncomplicated fracture are the most common type of injury in the permanent dentition.³

The goal of this project is to identify trends, incidence and epidemiologic aspects of pediatric dental trauma in a clinical hospital setting.

METHODS

- This study was approved by the UTHealth Houston Institutional Review Board.
- Patients aged 0-15 presenting to Memorial Hermann Hospital for dental trauma were selected.
- 179 charts were selected and the following information was obtained: Age, Gender, Race, Ethnicity, Date of Injury, Cause of injury, Description from emergency medicine physician containing:
 - Type of Injury
 - Injured Teeth
- Data was collected in Microsoft Excel and analyzed using Fisher's Exact Test, Pearson's Chi-squared Test. P values < 0.05 were considered statistically significant.

RESULTS

- Out of 179 patients presenting with TDI:
 - There were 98 males (54.7%) and 81 females (45.3%), with a ratio of 1.2:1 respectively.
 - In the 0-5 year old age group, the incidence of TDIs in males and females were the same (50% and 50%).
 - In the 6-11 year old age group, the incidence of TDIs in females was 44.6% and males was 55.4%.
 - In the 12-15 year old age group, the incidence of TDIs in females was 39% and in males was 61%.
- The most common mechanism of TDI was falls (55.3%, P = 0.002; Figure 1).
- Lateral/extrusive/intrusive luxations were associated with the primary dentition (P=0.018).
- Age, season, position in mouth (posterior vs anterior) and dentition (primary vs permanent) were associated with the incidence of alveolar/jaw fractures (P<0.05; Table 1).
 - There were more alveolar/jaw fractures in the 12-15 year old age group (P=0.01066), with alveolar/jaw fractures making up 36.8% of all TDIs in this age group; Figure 2).
 - There were the most alveolar/jaw fractures during the Summer (33.3% of all injuries during the summer), then the Spring (27.10%), then the Fall (16.7%), followed lastly by the Winter (6.3%) (P=0.008; Figure 3).
 - Of 10 TDIs involving posterior teeth, 4 (40%) sustained alveolar/jaw fractures. Of 241 TDIs involving anterior teeth, 25 (10.4%) sustained alveolar/jaw fractures (P=0.004).
 - Of 145 TDIs involving maxillary teeth, 23 (15.9%) sustained alveolar/jaw fractures (P=0.03). Of 21 TDIs involving mandibular teeth, 11 (52.4%) sustained alveolar/jaw fractures (P=0.007).
- There was an association with gender and the mechanism of injury (P=0.002).
 - 100% of sports-related injuries were males.
 - 69.2% of bike-related injuries were males.
 - 77.8% of injuries due to assault were males.
- This study showed that race, ethnicity, gender, and injury time had no effect on type of injury sustained by children.

Table 1. Incidence of Alveolar/Jaw Fracture by Position in Mouth and Type of Dentition

Jaw Position	Alveolar/Jaw Fracture	P Value
Maxillary (N=145)	23/145 (15.9%)	0.0304
Mandibular (N=21)	11/21 (52.4%)	0.007658
Tooth Position		
Anterior (N=241)	25/241 (10.4%)	0.003577
Posterior (N=10)	4/10 (40%)	0.003577

Figure 2. Incidence of Alveolar/Jaw Fracture by Age Group

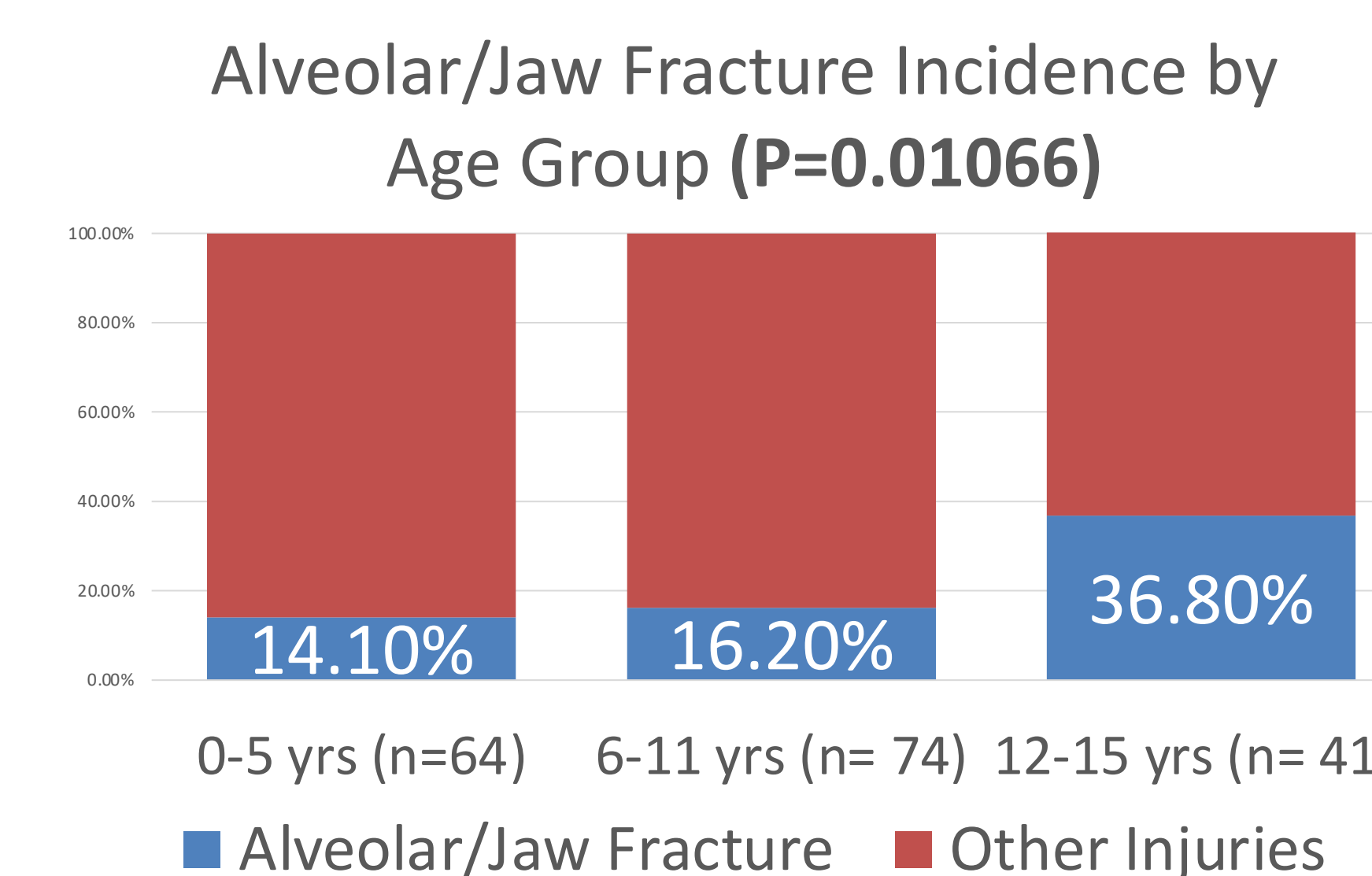


Figure 3. Incidence of Alveolar/Jaw Fracture by Season

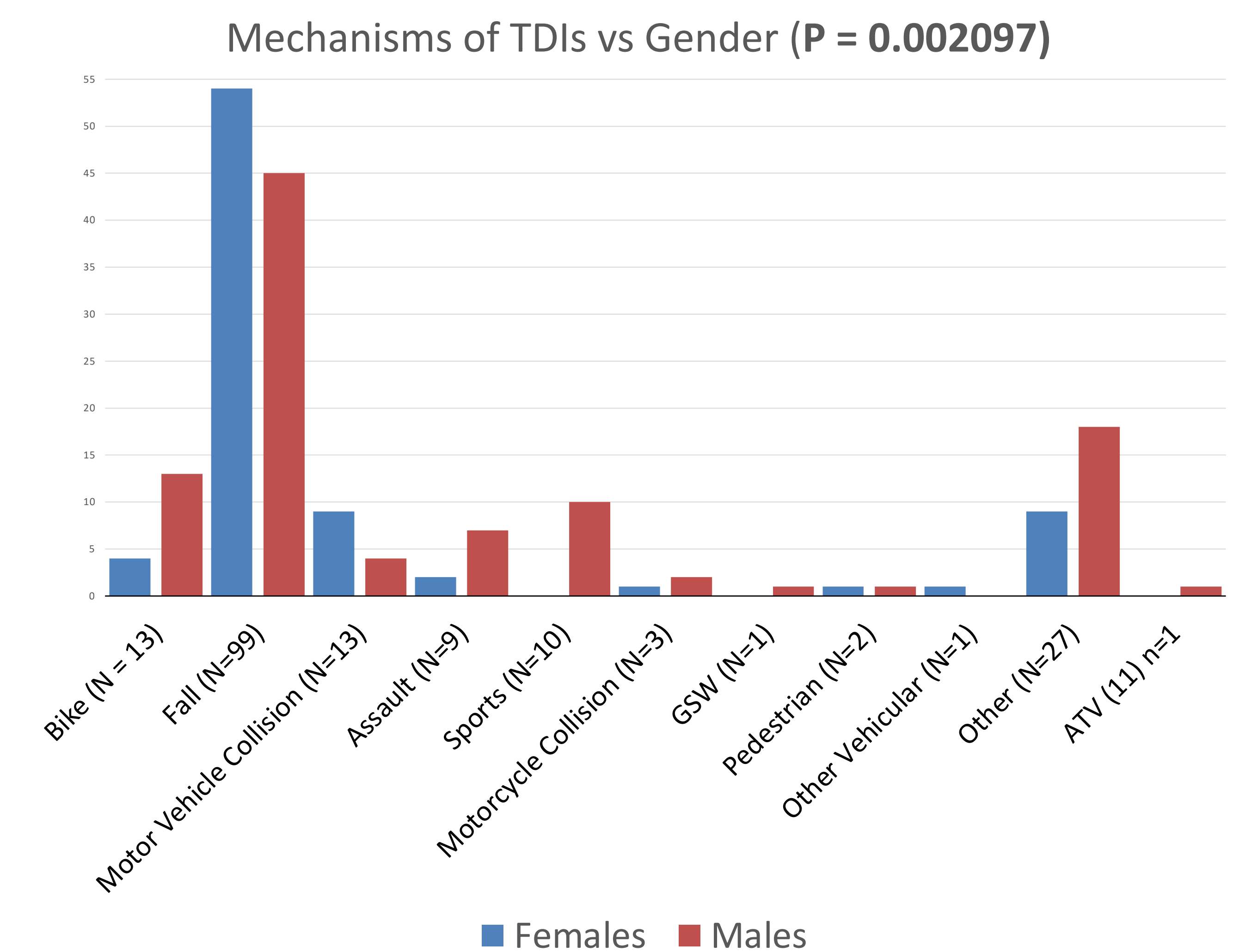
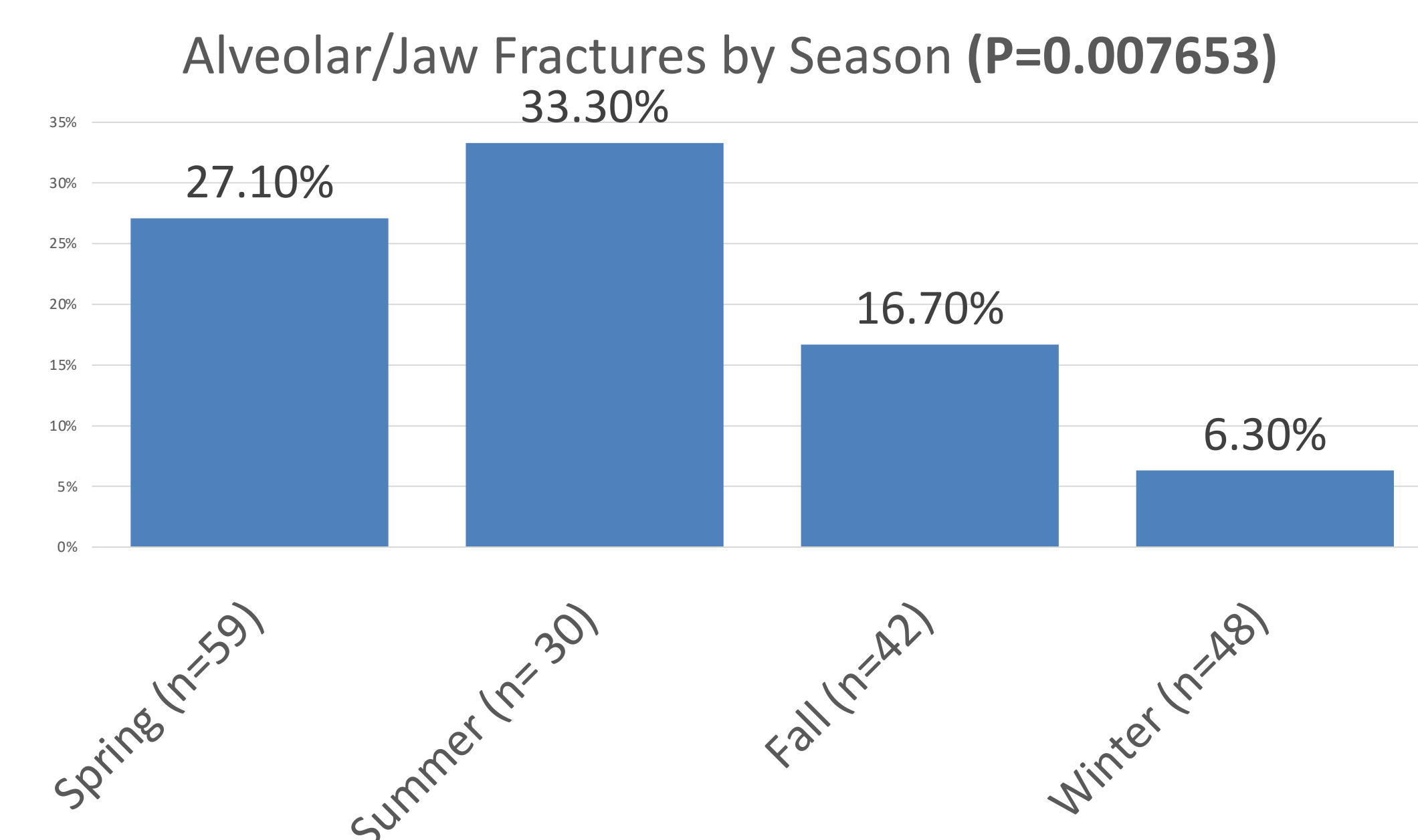


Figure 1. Incidence of TDIs by Mechanism and Gender

CONCLUSIONS

- In this study, the incidence of TDIs in males to females was 1.2:1 respectively. The presence of an alveolar/jaw fracture was associated with Summer and Spring, position of the TDI in the mouth, older age group. Males had a higher risk of sustaining a TDI from sports, bikes and assault. Falls were the most common mechanism of injury. Luxation injuries were associated with the primary dentition.** Current trends in TDIs are useful for practitioners to incorporate into anticipatory guidance to implement prevention strategies to decrease the incidence of TDIs.
- Limitations include** small sample size, non-descriptive diagnostic notes, incorrect ICD-10 coding, incorrect diagnosis of TDIs.
- This study highlights** the potential positive impact of interprofessional collaboration with emergency medical providers to improve diagnostic documentation and TDI epidemiology research.
- Further research** would benefit with a larger sample size and improved descriptive diagnostic note-taking.

ACKNOWLEDGEMENTS

This research was supported by Department of Pediatric Dentistry, University of Texas Health Science Center at Houston and Memorial Hermann Hospital Trauma Data Registry.

REFERENCES

