Temporal Trends of Abusive Pediatric Fractures: a Retrospective Study

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Introduction

Child Abuse:

- 25% of children experience maltreatment, 20% of whom are physically abused
- Fractures are the 2nd most common abusive injury

Temporal Trends of Fractures:

- Warmer temperatures, weekends, and evenings linked to higher rates of pediatric fractures
- Limited data on temporal trends of abusive fractures
- Understanding such patterns can improve detection and treatment of abusive fractures

Study aims:

- To identify temporal trends of abusive pediatric fractures by evaluating emergency department (ED) clinicians' and child abuse pediatricians' (CAPs) concerns for abuse among young children who present to the ED with fractures

Methods

Retrospective observational study (N=4285):

- Children ≤5 years presenting to Hasbro ED from March 2015-April 2023 with 1+ fracture diagnosis
- Data from patient records

Measures:

- Demographic data
- Encounter temporality:

Day	Shift	Season
Mon-Fri	0700-1459	Spring (03/21-06/20)
Sat-Sun	1500-2259	Summer (06/21-09/20)
	2300-0659	Fall (09/21-12/20)
		Winter (12/21-03/20)

- Presence of CAP recommendation for abuse workup
- CAP determination of fracture etiology:

Abuse/Neglect
Indeterminant
Accident/Birth trauma

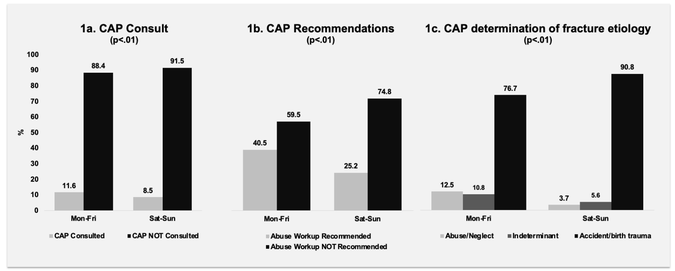
Analysis:

- Descriptive statistics and chi-squared analyses were performed

Results

- Of the 4285 encounters, the mean age was 38.6 months (SD 20). 55.4% were male, 60.2% White, 8.2% Black, and 71.9% non-Hispanic. 56% of encounters had private insurance and 41.8% had government.
- 10.7% (N=458) of encounters had a CAP consult ordered by ED clinician. 36.7% (N=168) of CAP consults had a child abuse workup per CAP recommendations.

Figure 1. Encounter weekday vs. weekend trends by: CAP consult, CAP recommendations, and CAP determination of fracture etiology



Weekday vs. weekend and seasonal distribution (Figures 1, 3) of encounters differed significantly when stratified by CAP consult, recommendations, and determined fracture etiology.

Figure 2. Encounter shift trends by: CAP consult, CAP recommendations, and CAP determination of fracture etiology

Shift distribution (Figure 2) of encounters differed significantly by CAP consult and recommendations.

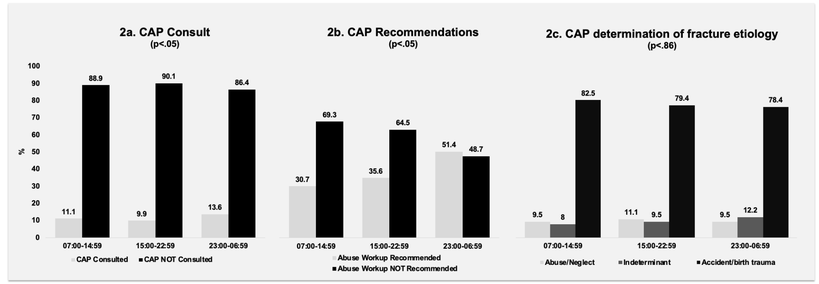
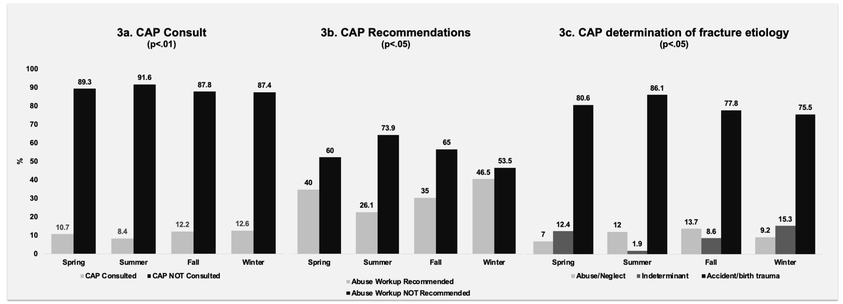


Figure 3. Encounter seasonal trends by: CAP consult, CAP recommendations, and CAP determination of fracture etiology



1.1% (N=47) of all encounters were determined to be due to abuse/neglect. 1% (N=43) were indeterminant.

Conclusions

- This is one of few studies to specifically evaluate temporal trends of ED presentation among children with fractures evaluated for child maltreatment.
- Results demonstrate temporal patterns distinct from those in previous literature.
- The study design cannot elucidate the reasons for identified temporal trends, but drivers are likely multifactorial. Further exploration of these patterns is indicated.

Limitations

- Retrospective studies can have miscategorization.
- Results may not be generalizable to other ED settings or climates nationally.

Future Directions

- Similar studies with larger cohorts in different ED settings and regions can further identify context specific trends.

Funding Source

This study was supported by the National Institute of General Medical Sciences of the National Institutes of Health (NIH) under Award Number P20GM139664. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

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