Graded Analysis of Intellectual Disability Severity and Risk of Non-Accidental Traumatic Fractures in Pediatric Patients: A Nationwide Study of 825,451 Pediatric Patients

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INTRODUCTION: Non-accidental traumatic fractures (NATF) in the pediatric population are a serious concern, particularly in children with intellectual disabilities. Understanding the relationship between the severity of intellectual disability and the occurrence of NATF can aid in identifying at-risk individuals and developing preventive strategies. This study aimed to investigate this relationship using data from a large national database in the United States.

METHODS: Utilizing a large national database in the United States, we conducted a case-control study utilizing data from January 2003 to March 2023, involving a total of 851,094 pediatric patients. Of these, 25,643 were in the NATF group, while 825,451 were in the non-NATF control group. We controlled for race, ethnicity, sex, BMI percentile, and age through multivariable logistic regression models. The severity of intellectual disabilities was categorized, and the odds ratios (OR) for NATF occurrence were calculated.

RESULTS:

The mean age of patients in the NATF group was 1.89 ± 1.85 years, compared to 2.82 ± 1.90 years in the non-NATF group. The BMI percentile was similar between the groups (NATF: 63.7 ± 22.67 , non-NATF: 66 ± 25.2). A higher percentage of males were present in the NATF group (55%) compared to the non-NATF group (46%). The distribution of race and ethnicity was comparable between the groups. The analysis revealed significant associations between the severity of intellectual disabilities and the occurrence of NATF. Overall intellectual disabilities were associated with a higher risk of NATF (OR, 5.27 [95% CI, 4.62 to 6.02]; p < 0.0001). The risk increased with the severity of the disability: mild (OR, 3.72 [95% CI, 2.63 to 5.27]; p < 0.0001), moderate (OR, 3.47 [95% CI, 2.10 to 5.72]; p < 0.0001), severe (OR, 7.24 [95% CI, 4.66 to 11.25]; p < 0.0001), and profound intellectual disabilities (OR, 10.06 [95% CI, 6.12 to 16.54]; p < 0.0001).

DISCUSSION AND CONCLUSION:

This study demonstrates a significant relationship between the severity of intellectual disabilities and the occurrence of non-accidental traumatic fractures in pediatric patients. The findings highlight the need for targeted interventions and monitoring strategies for children with severe and profound intellectual disabilities to prevent NATF. These results can inform clinical practices and policy decisions to protect this vulnerable population.



Diagnoses	OR	LB	UB	Р
Overall intellectual disabilities	5.27	4.62	6.02	<0.0001
Unspecified intellectual disabilities	5.01	4.24	5.92	< 0.0001
Mild intellectual disabilities	3.72	2.63	5.27	< 0.0001
Moderate intellectual disabilities	3.47	2.10	5.72	< 0.0001
Severe intellectual disabilities	7.24	4.66	11.25	< 0.0001
Profound intellectual disabilities	10.06	6.12	16.54	< 0.0001