Original Article

TRAUMATIC DENTAL INJURY AMONG 9-11-YEAR-OLD CHILDREN IN RURAL PUBLIC SCHOOLS IN ENUGU STATE, NIGERIA

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Abstract

Background: Traumatic dental injuries can occur among children in rural communities, and their prevalence may vary from one location to another.
Objective: To determine the prevalence, pattern of presentation, and association of age and sex with traumatic dental injuries among 9–11-year-old schoolchildren in rural communities in Awgu Local Government Area, Enugu State, Nigeria.
Methods: A cross-sectional descriptive study was conducted among 9–11-year-old schoolchildren in six public schools selected from Awgu Local Government Area of Enugu State. Ethical clearance was obtained, and informed consent was obtained from the parents of the participating children. Data were collected using a questionnaire. Oral examinations for the presence of traumatic dental injuries were conducted using the Ellis and Davey criteria. The association of age and sex with traumatic dental injuries was assessed using Fisher's exact test. Statistical analysis was performed using SPSS version 26. A p-value of <0.05 was considered statistically significant.
Results: A total of 218 schoolchildren were examined, of whom 111 (50.9%) were males. The participants were aged 9–11 years, with a mean age of 10.0 ± 0.8 years. The prevalence of traumatic dental injuries was 3.2%. Traumatic dental injuries were more common among males and 9-year-old children. Fractures involving enamel with a small amount of dentine exposure and single-tooth fracture presentations were the most common findings.
Conclusion: The prevalence of traumatic dental injuries was 3.2%, and no significant association was found between traumatic dental injuries and age or sex. Oral health education on preventive measures and management is recommended.
Keywords: Children, Community, Injury, Locality, Trauma

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INTRODUCTION

Traumatic dental injuries and their complications can be a reason for emergency visits to a dental clinic.[1] They can be associated with pain, a shocking sensation, discolouration, and dentoalveolar abscesses. Traumatic dental injuries to the teeth and supporting tissues can occur as a result of collisions with inanimate objects, falls, communal violence, sports-related accidents, road traffic accidents, bicycle accidents, assaults, and non-accidental injuries.[1–5] Some predisposing factors for traumatic dental injuries include increased overjet, medical conditions such as seizures, epilepsy, cerebral palsy, poor vision, inadequate lip coverage of the upper anterior teeth, and proclined incisors.[3,4]

In India, the prevalence of traumatic dental injuries among 9–14-year-old children was 16.3%.[2] In Nigeria, the prevalence of traumatic dental injuries among 6–11-year-old schoolchildren in urban areas of Enugu State, South-East Nigeria, was 11.6%.[5] Maxillary central incisors are commonly affected by traumatic dental injuries,[3,4] and root-end closure of the maxillary central incisors may still be ongoing among some 9–11-year-old children with late tooth eruption.

There are few studies on traumatic dental injuries among children in rural communities in Nigeria. Children in rural areas have limited access to oral healthcare because of the low availability of oral health facilities and oral health professionals in most rural communities. Community-based studies on traumatic dental injuries among children in rural areas can serve as a baseline for planning oral health intervention programmes for children with traumatic dental injuries. The aim of this study was to determine the prevalence, pattern of presentation, and association of age and sex with traumatic dental injuries among 9–11-year-old schoolchildren in rural communities in Awgu Local Government Area, Enugu State, Nigeria.

MATERIALS AND METHODS

A cross-sectional descriptive study was conducted among 9–11-year-old school children in six public schools selected from Awgu Local Government Area of Enugu State. Enugu State is located in the South-East geopolitical zone of Nigeria. There are seventeen Local Government Areas in Enugu State, and more than nine of them are predominantly rural.

Ethical clearance for this study was sought and obtained from the Health Research Ethics Committee of the University of Nigeria Teaching Hospital. Informed consent was obtained from the parents of the participating children, and assent was obtained from the children. The participants were randomly selected in each public school through the drawing of numbered ballot papers.

The sample size for this study was calculated using the formula

$$N = \frac{Z^2pq}{d^2}$$ [6]

N = sample size
p = prevalence
q= 1.0-p
The sample size was calculated using the following values:
Prevalence of traumatic dental injury was 15.2. % from a previous study in Nigeria [7]

confidence interval 95% (z = 1.96),
d= Margin of Error tolerated, 5% (0.05)

p= 0.152, q= 1.0-p = 0.848, z = 1.96 ,d= 0.05

$$N = \frac{1.96x1.96x\ 0.152\ x0.848}{0.05^2}$$

= 198.1

198 approximately

10% of non- responders = 19.8; 198 + 20 = 218.

Two hundred and eighteen school children were selected. Data collection was done using questionnaire and sterile oral examination tool in the year 2024. Oral examination for the presence of traumatic dental injury was done according to Ellis and Davey classification[8] of traumatic dental injury, using pre-defined inclusion and exclusion criteria.

The school children were examined while seated on classroom chairs. Periapical radiographs and pulp sensibility/vitality tests were not conducted in the school environment during data collection. Data were entered and analysed using the Statistical Package for the Social Sciences (SPSS) version 26. Descriptive statistics were used to determine the prevalence of traumatic dental injuries among public-school children in the rural communities. The association of age and sex (independent variables) with traumatic dental injuries (dependent variable) was assessed using Fisher's exact test. P-values < 0.05 were considered statistically significant.

RESULTS

A total of 218 schoolchildren were examined, of whom 111 (50.9%) were males. The participants were aged 9–11 years, with a mean age of 10.0 ± 0.8 years. Table 1 shows that the prevalence of traumatic dental injuries was 3.2%. Traumatic dental injuries were more common among males and 9-year-old children.

Table 2 shows that tooth fractures involving enamel with minimal dentine involvement were the most common pattern of presentation. The maxillary central incisors were the teeth most commonly affected by traumatic dental injuries, and injuries occurred more frequently on the left side of the maxillary dental arch. Single-tooth

fractures were more common than multiple-tooth fractures.

Table 3 shows that there was no statistically significant association between sex (p = 0.446), age (p = 0.401), and traumatic dental injuries.

Table 1: Profile of the study participants

Variables	TDI present n (%) = 7 (3.2%)	TDI absent n (%) = 211 (96.8%)	Total N (%) = 218 (100.0%)
Age			
9	4(5.5)	69(94.5)	73(100.0)
10	2(2.6)	75(97.4)	77(100.0)
11	1(1.5)	67(98.5)	68(100.0)
Sex			
Male	5(4.5)	106(95.5)	111(100.0)
Female	2(1.9)	105(98.1)	107(100.0)

Table 2: Pattern of presentation, tooth and dental arch involved among children with traumatic dental injury experience

Variable	Frequency%
Pattern of presentation	
Enamel with little dentine	5(71.4)
Enamel with considerable dentine	2(28.6)
Tooth involved	
Central incisor	6(85.7)
Lateral incisor	1(14.3)
Others	0(0.0)
Arch involved	
Maxillary teeth	7(100.0)
Mandibular teeth	0(0.0)
Quadrant involved	
Right	2(28.6)
Left	4(57.1)
Both	1(14.3)

Table 3: Association between age, sex and traumatic dental injury among the study participants N=218

Variable	p-value
Age (years)	0.401*
Sex	0.446*

**Fisher's exact test*

DISCUSSION

Traumatic dental injuries commonly affect the anterior teeth. Home environments, streets, roads, schools, playgrounds, and recreational areas are places where traumatic dental injuries can occur among children.[1–4] Traumatic dental injuries can occur among children in rural and underserved communities, and their prevalence may vary according to differences in aetiological and predisposing factors.[1,9]

This study provides information on the prevalence, pattern of presentation, and association of age and sex with traumatic dental injuries among 9–11-year-old schoolchildren in selected rural communities in Awgu Local Government Area, Enugu State, South-East Nigeria.

The prevalence of traumatic dental injuries in this study was comparable to the 3.7% reported among 12–15-year-old schoolchildren in rural communities in Udi and Nkanu West Local Government Areas of Enugu State, South-East Nigeria.[4] This finding may be attributed to lower risk-taking behaviours and fewer predisposing factors among children in rural areas. The prevalence of 3.2% observed in this study was lower than the 11.6% reported among 6–12-year-old children in urban areas of Enugu State, South-East Nigeria,[5] and the 11.4% reported among 8–12-year-old children in urban areas of Edo State, South-South Nigeria.[3]

This variation may be due to higher levels of risk-taking behaviour among children in urban communities,[9] greater participation in outdoor activities, and increased vehicular and motorcycle traffic in urban settings. The prevalence observed in this study was also lower than the 9.7% reported among 8–13-year-old schoolchildren in India.[10] This difference may be explained by variations in socioeconomic conditions, participation in sporting and outdoor activities, sociocultural factors, levels of child supervision,[11] and geographical differences among study populations.

Traumatic dental injuries can affect the crown, root, and supporting structures of a tooth.[4] In this study, fractures involving enamel with minimal dentine involvement were the most common pattern of presentation. This finding is consistent with those of previous studies[3–9] but differs

from another reported study.[4] Single-tooth fractures were the most common presentation in this study, which is in agreement with previous findings.[4]

Traumatic dental injuries occurred more frequently among males, which is consistent with previous studies.[2,9,11] This may be because males are generally more involved in sporting, outdoor, and physical activities.[12] The maxillary central incisors were the teeth most commonly affected, which is also consistent with previous studies.[4,10]

The association between age, sex, and traumatic dental injuries was not statistically significant. This finding agrees with previous studies.[4,11] Since this study was conducted only among pupils attending selected public schools, the findings may not be representative of children attending private schools or out-of-school children in the rural communities. Slight or marked variations in findings may occur if participants are selected from both public and private schools or through household surveys.

CONCLUSION

The prevalence of traumatic dental injuries among the study participants was 3.2%, and it was not significantly associated with age or sex. All fractured teeth identified during the study were untreated. Interventions aimed at the management of untreated fractured teeth are therefore recommended.

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Conflicts of Interest: There are no conflicts of interest.

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