International Journal of Medical Science and Clinical Research
Online-ISSN: 2664-7761; Print ISSN: 2664-7753
Received: 07-10-2020; Accepted: 22-10-2020; Published: 16-11-2020
www.journalofmedical.com
Volume 2; Issue 4; 2020; Page No. 23-26

The distribution of fractured teeth amongst students of Delta State University in Abraka, Nigeria

Ese Anibor, Martins Obaroefe*, Isioma Cynthia Nwaokoro, Precious Emeka Ugoh
Department of Human Anatomy and Cell Biology, Faculty of Basic Medical Sciences, Delta State University, Abraka, Nigeria

Abstract
Objective: To establish the distribution of fractured teeth among Delta State students in Abraka, Nigeria.
Methods: The study employed the observational cross-section survey design. Simple size involved 384 (three hundred and eight four) aged between 17-31years. Simple random sampling technique was used. The mouth of each study subject was examined intra-orally for presence of fractured teeth and other data like cause of teeth fracture, and level of pain were also collected. Data obtained were analyzed and Chi- square was used as inferential statistics.
Results: The results showed the distribution of fractured teeth among the sample studied was 63(16.4%) with road traffic accident (RTA) being the most common cause of fracture 43(68.3%). Bikes accounted for 26(41.3%) and cars 17(27.0%) of the accidents respectively, followed by sports 13(20.6%), and other causes 7(11.1%). Majority 146(64%) had mild tooth pain while minority (8.3%) experienced intense pain.
Conclusion: The predominance of fractured teeth was established to be 16.4%. The most frequent cause of tooth fracture was RTA which was followed by sports. The occurrence of fractured teeth did not vary significantly according to gender and age.

Keywords: Fractured teeth, tooth pain, traumatic injuries

1. Introduction

The hardest and harshest substances in the human body is regarded as the teeth [1] and a fracture is termed an incomplete or complete breakage of a bone [1]. Hence, fractured tooth is referred to as broken tooth sometimes accompanied with pain and aches depending on the fracture severity [2]. The effect of tooth fracture increases in severity and intensity depending on the fracture state. It ranges from minor fractures associated with little or no pain which sometimes require little or no treatment to major or severe fractures which may result to root canal therapy (RCT) or even tooth loss [3]. Approximately 82% of traumatized teeth are maxillary teeth [4]. In the immediate aftermath of a tooth fracture, a person's toughest decision is whether to see a dentist or not [5].

In addition to being necessary for chewing, teeth play a significant role in speech [6]. Anatomically, the teeth contain the crown, the part predisposed to the oral cavity, with its roots enveloped in the bone and periodontium. In the transverse portion, the tooth is distinctively divided into three layers: with the first been a surface enamel layer that only covers the crown, followed by an inner layer of dentin in both the crown and the root and lastly, the central area known as the pulp that includes nerves, arteries and veins [1].There are numerous teeth types with distinctive functions [6, 7]. There are also fractures of various types and they include oblique supra-gingival fracture [8], oblique sub-gingival fracture [9], oblique sub-gingival fracture [9] oblique root fracture [5, 10, 11] and Vertical apical root fracture [12].

Other types of fractured teeth include craze lines [13], fractured cusp [13, 14], cracked tooth [11, 15], split tooth [12], vertical root fracture [2] and fracture necrosis [16]. Some common causes of fractured teeth include trauma, grinding of tooth, use of teeth for mechanical works such as opening of drinks e.t.c. [17, 18].

Instead of causing consistent dull pain, fractured teeth cause sharp pains that comes and goes [2]. Studies reviewed have reported risks of broken teeth drawing attention to the multifactorial nature of broken teeth, to etiology, with normal predisposing characteristics and iatrogenic component as primary factors predisposing teeth to cracks [9]. Therefore, the objective of this research was to establish the prevalence of fractured teeth among Delta State students in Abraka, Nigeria.

2. Materials and Methods

The present study adopted the observational cross-sectional survey sort of the quantitative design. The study population included both male and female undergraduate students of the Delta State University, Abraka. This research work was carried out in the Delta State University, Abraka.

The study employed a sample size of 384 and the simple random sampling technique was used. Data was collected using semi-structured questionnaires. Intra-oral examination was carried out and a fixed response/closed end questionnaires method was also applied. Subjects were seated and ADA type III oral examination was done by means of a mouth mirror and dental probe under ample lighting. Questions were asked pertaining to causes of teeth fracture, history of pain if any occurs and whether or not treatment has been administered to the teeth.

Subjects within the age of 17-31 years were included in the study. The clearance to conduct this research work was obtained from the Research and Ethics Committee of Human Anatomy and Cell Biology Department in the Delta State

University in Abraka.

2.1 Statistical Analysis

The data obtained were subjected to statistical analysis using frequency distribution for descriptive analysis and chi-square contingency table as the inferential statistics with the aid of Statistical Package for the Social Sciences (SPSS) version 23. $P< 0.05$ was considered statistically significant.

3. Results and Discussion

Figure 1 showed that majority of the respondents were aged between 22-26 years (n=211, 54.9%), followed by age group 17-21 years (n=141, 36.7%) and 27-31 years (n=32, 8.3%). As seen in the figure 2, majority of the respondents were females (n=195, 50.8%) while minority were males (n=189, 49.2%). Figure 3 shows that the prevalence of respondents with fractured teeth are 63 (16.4%) while those without fractured teeth consisted of 312 respondents which made up 83.6% of the respondents. In figure 4, it is showed that majority of the respondents with fractured teeth (59.4%) said that they experience tooth pain while minority (40.6%) of the respondents with fractured teeth did not. From figure 5 above, it can be observed that majority of the respondents with fractures do not experience pain (84.6%) while minority (15.4%) of the respondents with fractures experience pain while chewing and biting. As shown in the table 1, majority (n=40, 64%) of the respondents with fractures who said they experience pain had mild tooth pain which was followed by respondents with moderate pain (n=18, 27.6%) with the least been respondents with intense pain accounting for n=5 (8.3%). Table 2 showed that majority of the respondent did not experience sharp pain which constituted 88.0% (n=55) of the respondents with only 8 (12.0%) who reported sharp pain. From table 3 above, it can be observed that fractured teeth below gumline occurred in 23 (39.7%) respondents which reported fracture tooth/teeth with 40 (63.3%) of the respondents with fracture above gum line. As shown in the table 4 above, it can be observed that the most common cause of fracture was RTA 43 (68.3%) which were via bike 26(41.3%) and car 17 (27.0%) accidents respectively, followed by sport 13 (20.6%), and others (n=7, 11.1%). From table 5, it is shown that fractured teeth were more common in age group 22-26 years (n=35, 55.6%), followed by age group 17-21 years (n=24, 38.1%), and then 27-31 years (n=4, 6.3%). It was also divulged from the table that there was no statistically significant association (p=0.819) between age and fractured teeth/tooth. Table 6 revealed that fractured teeth are slightly more prevalent in females (n=32 [50.8%]) than in males (n=31 [49.2%]) and it was also observed that there was no significant association between gender and fractured teeth/tooth (p=0.998).

The etiological factors of fractured teeth, the degree of pain encountered by the person affected, the distribution of fractured teeth between different ages as well as gender and the common cause of fractured teeth were examined in this observational study. Worldwide, the incidence of traumatic dental injuries varies from 6-27% [19, 20].

In the present analysis, the incidence of broken teeth from the sample of the study population investigated was 63 (16.4 percent) [21]. observed that incidence of dental trauma, especially in the pediatric and adolescent population is of significant nature and affects up to one third of patients in this age group.

Majority (64%) of the respondents who said they experienced tooth pain had mild tooth pain while minority (8.3%) experienced intense pain. Also, majority of the respondents do not experience pain while chewing or biting (15.4%) [22]. estimated that 22% of the general population experiences orofacial pain in any given six months period. Another study by [23], revealed that differentiation research has demonstrated that after teeth fracture, organization and activity of central and peripheral nerves can change. This can result to chronic pain and other related symptoms (paresthesia or dysesthesia). It has also been reported by [24] that other mechanisms are involved in the pathogenesis of tooth pain which includes sensitization of pain fibres, sprouting of adjacent afferent fibres, sympathetic activation of afferents, cross- activation of afferents, loss of inhibitory mechanisms and phenotype switching of afferent neurons.

The most common cause of fracture was road traffic accident (RTA) 43(68.3%) which were bike 26 (41.3%) and car 17(27.0%) accidents respectively, this was followed by sport 13(20.6%) and other causes (n=5, 7.9%). This was in agreement with [25] who reported that the most common risk factors are falls, automobile/bicycle accidents, collisions, gender and age, some behavioral characteristics, physical and sporting activity. This present study is also in tandem with the work of [26], who stated that falls in violent battles, auto-mobile and bicycle accidents are the most common etiological variables of crown-root fractures.

In the present study, fractured teeth were seen to be more in age group 22-26 years (n=35, 55.6%), followed by age group 17-21 years (n=24, 38.1%) and 27-31 years (n=4, 6.3%). This consociation was not statistically significant (P=0.819). Furthermore, fractured teeth were found to be more common in females than in males (n=32 in females and n=31 in males). Also, no significant gender difference (p=0.998) occurred in frequentness of tooth fracture. This finding is partly in agreement with the work of [27] who observed that frequency of dental trauma was higher in men than in women which was still not statistically significant (P=0.674).

The deviation in predominance of dental fracture in the different studies disclosed above may be connected to scrutiny of different populations, sample selection criteria or the location where the inquiry was done.

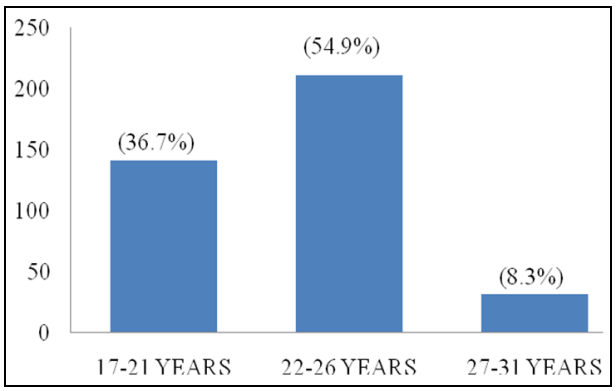

Fig 1: Age distribution of Participants

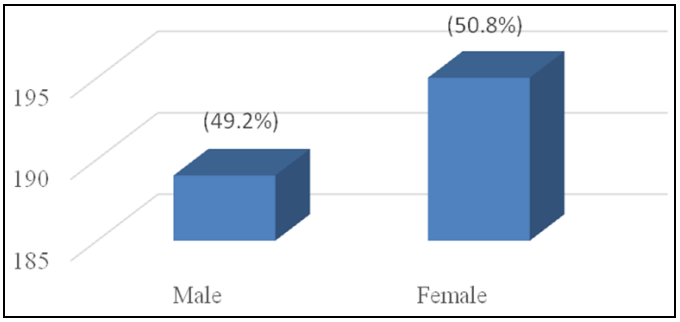

Fig 2: Gender distribution of Participants

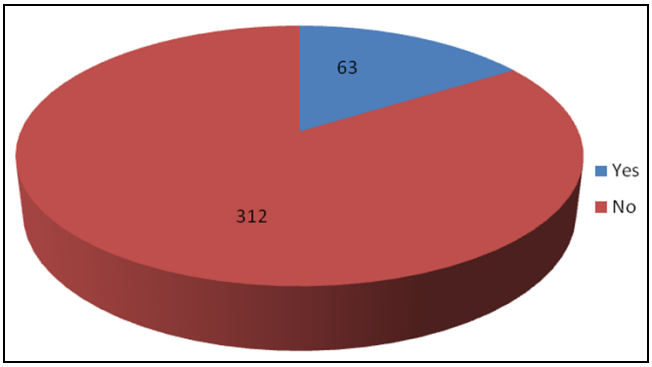

Fig 3: Prevalence of Fractured tooth.

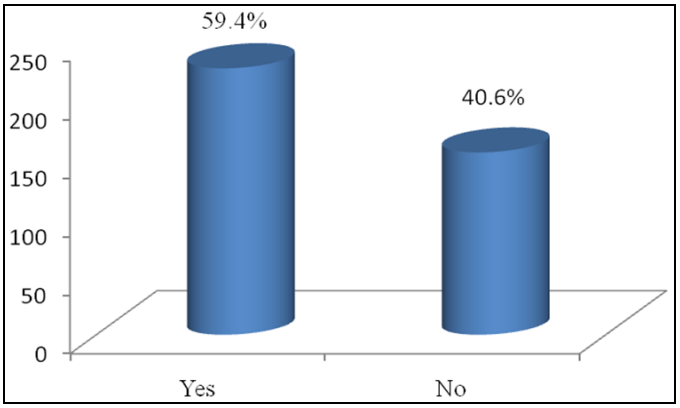

Fig 4: Distribution of Tooth pain among respondents with tooth fractures

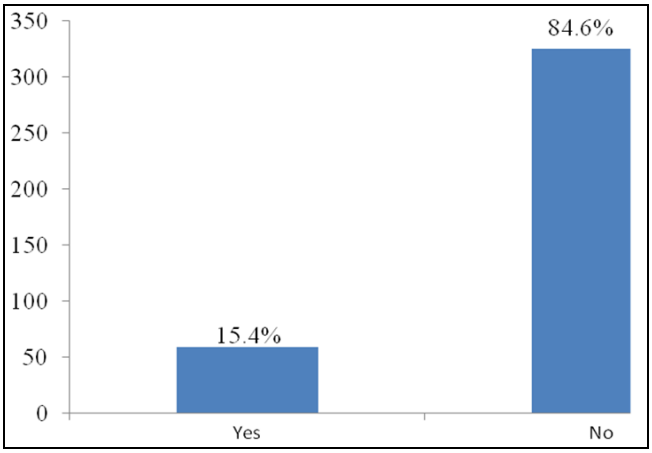

Fig 5: Distribution of respondents with fractures who experienced pain while chewing or biting

Table 1: Level of Pain

	Frequency	Percentage (%)
Mild	40	64.0
Moderate	18	27.6
Intense	5	8.3
Total	63	100.0

Table 2: Distribution of Sharp pain

	Frequency	Percentage (%)
Yes	8	12.0
No	55	88.0
Total	63	100.0

Table 3: Distribution of Respondents with Fracture below gum line

	Frequency	Percentage (%)
Yes	23	39.7
No	40	63.3
Total	63	100.0

Table 4: Causes of Fractured Teeth

	Frequency	Percentage (%)
Bike accident	26	41.3
Car accident	17	27.0
Sports injury	13	20.6
Others	7	11.1
Total	63	100.0

Table 5: Distribution of Fractured Teeth among Age Groups

	Presence of Fracture		
Age (years)	Yes	No	Total
17-21	24 (38.1%)	117 (36.4%)	141 (36.7%)
22-26	35 (55.6%)	176 (54.8%)	211 (54.9%)
27-31	4 (6.3%)	28 (8.7%)	32 (8.3%)
Total	63 (100.0%)	321 (100.0%)	384 (100.0%)

Table 6: Distribution of Fractured Teeth among Genders

Gender	Fractured Teeth		
	Yes	No	Total
Male	31 (49.2%)	158 (49.2%)	189 (49.2%)
Female	32 (50.8%)	163 (50.8%)	195 (50.8%)
Total	63 (100.0%)	321(100.0%)	384 (100.0%)

5. Conclusion

The predominance of fractured teeth was established to be 16.4%. The most frequent cause of tooth fracture was RTA which was followed by sports. The occurrence of fractured teeth did not vary significantly according to gender and age.

6. References

1. Hoffman MMD. Human Anatomy. 2nd edition, 2017, 146-152.
2. Bader JD, Martins JA, Shugars DA. Preliminary Estimates of the Incidence and Consequences of Tooth Fracture. J Am Dent Assoc. 1995; 135:1650-1654
3. Erinne B, Lubusich. Cracked Teeth: A Review of the Literature. J of EstheRestor Den. 2010; 22(3):158-167.
4. Byoung – Duck Roh and Young- Eun Lee. Analysis of 154 Cases of Teeth with Cracks. Dental traumatology. 2006; 22(3):118-123.

5. Berman LH, Kuttler S. Fracture Necrosis: Diagnosis, Prognosis Assessment and Treatment Recommendations. 2010; 36(3):442-442.
6. Moore KL, Fallen AF, Augur AM. Clinically Oriented Anatomy, 7th Edition, 2013, 1122-1124.
7. Agur MRA, Dalley FA. Grant Atlas of Anatomy; 12th Edition, 2009.
8. Gher ME, Jr Dunlap RM, Anderson MH, Kuhl LV. Clinical Survey of Fractured teeth. JAM Dent Assoc. 1987; 114:174-177.
9. Geurtsen W, Garcia – Godoy F. Bonded Restorations for the Prevalence and Treatment of Cracked Tooth Syndrome. Am J Dent. 1999; 12:266-270.
10. Kapil L, Anju L, Rhythm B, Vivek KB. A Proposal for Classification of Tooth Fracture Based on Treatment Need. Journal of Oral Science. 2010; 52(4):517-529.
11. Cameron CE. The Cracked Tooth Syndrome: J Am Dent Assoc. 1976; 93:971-985.
12. Silvestri AR. The Undiagnosed Split-Root Syndrome. J Am Dent Assoc. 1976; 92:930-935.
13. Rivera EM, Walton RE. Cracking the Cracked Tooth Code: Detection and Treatment of Various Longitudinal Tooth Fracture. AAE, Colleagues for Excellence, Newsletter, summer, 2008.
14. David E Snyder. The Cracked- Tooth Syndrome and Fractured Posterior Cusp. Oral Surgery, Oral Medicine, Oral pathology. 1976; 41(6):698-704.
15. Lynch CD, McConnell RJ. The cracked Tooth Syndrome. J Can Dent Assoc. 2002; 68:470-475.
16. Jeff L. The silent epithemic part ii – Spear Education, 2016.
17. Abou-Rass M. Crack Lines: The Precursors of tooth Fractures- their Diagnosis and Treatment. Quintessence Int. 1983; 14:437-447.
18. Dabar UR, Hugget R, Harrison A. Dental Fracture. British Dental Journal. 1994; 176:342-345.
19. Jamani KD, Fayyad MA. Prevalence of traumatized permanent incisors in Joranian Children, According to Age, Sex and Socio- Economic Class. Odontostomatol Trop. 1999; 14(2):17-20.
20. Lami's D Rajab. Thraumaic Dental Injuries in Children Presenting for Treatment at the Department of Pediatric Dentistry. Dental traumatology. 2003; 19(1):6-11.
21. Liew VP. Reattachment of Original Tooth Fragment to a Fractured Crown-Case Report. Australia Dental Journal. 1988; 33(1):47-50.
22. Lipton JA, Ship JA, Larach – Robinson D. Estimated Prevalence and Distribution of Reported Pain in the United States. J Am Dent Assoc. 1993; 124(10):115-21.
23. Chen R, Cohen LG, Hallett M. Nervous System Reorganization following in jury. Neuroscience. 2002; 111(4):761-73
24. Hu JW, Woda A, Sessls BJ. Effects of pre-emptive local anesthesia on tooth pulp deafferentiation – induced neutroplastic changes in cat trigeminal brainstem neurons. Arch Oral Biol. 1993; 44(3):287-93.
25. Gojanur S, Yeluri R, Munshi AK. Prevalence and Etiology of Traumatic Injuries to the Anterior Teeth among 5 to 8 Years Old School Children in Mathura City, India: An Epidemiology Study. Int J ClinPediatr Dent. 2015; 8(3):172-175
26. Tirthankar B, Debolina C, Das CK, Priti D. Management of Aterior Teeth Fracture with Preservation of Fractured Fragment –two Case Reports. DrpritiDesia, 2016, 47-56.
27. Kirk KJ, Hughes DA, Sampathkum A, Longbottom C. Imaging and detection of early stage dental caries with aal-optical photocoustic microscope. Journal of physics. 2016; 581:1480-1485