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OCCURRENCE AND COMPLICATIONS OF SUPERNUMERARY TEETH AMONG PEOPLE LIVING IN GOMBE STATE, NIGERIA

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ABSTRACT

The present study is aimed to evaluate the occurrence and complications of supernumerary teeth among people living in Gombe State, Nigeria. The total number of 300 individuals with an equal number of males (n=150) and females (n=150) with ages ranges from 5-78 years attending the dental clinic, specialist hospital Gombe for different reasons of dental complain and routine dental check-up were randomly selected for this research. The data was collected with the subject sited on a chair under a sunlight. The oral examination was carried out using a mouth mirror, hand gloves, and a blunt probe. The teeth were cleaned of food debris with cotton wool for proper visibility. The observed supernumerary teeth were classified under different classifications. The obtained data were subjected to Chi-squared test to obtain differences in supernumerary teeth distribution using SPSS version 20.0 software (IBM Corporation, USA). The result shows a 5.2% prevalence of supernumerary teeth in which is more in the incisor presented 3.39 %. The location was more in the maxillary arch 90 % (n = 311), about 35.8% (n = 124) of the supernumerary teeth were erupted. This study finds that the frequency of supernumerary teeth was higher in children (5-10 years), which is more around the incisor of the maxillary region, in which most of them have singly erupted and asymptomatic. However, some of them are accompanied by some symptoms like impaction, crowding, and displacement.

Keywords: Occurrence, Supernumerary, Teeth, Hospital, Gombe

INTRODUCTION

The supernumerary teeth are any extra tooth that developed away from normal dentition; this condition is also known as "hyperdontia." The occurrence of supernumerary teeth in the permanent dentition is between 0.5 and 5.3% and in primary dentition is between 0.2 and 0.8% in different populations (Sasaki *et al.,* 2007; Ferrés-Padró *et al.,* 2009; Diaz *et al.,* 2009; Kaya *et al.,* 2011; Demiriz *et al.,* 2015). The prevalence of supernumerary teeth or hyperdontia is more frequent in males than in females, which may be associated with several complications like cleidocranial dysplasia, Gardner's syndrome, Ehlers–Danlos syndrome, and Fabry–Anderson syndrome (Fernandez *et al.,* 2006; Leco Berrocal *et al.,* 2007; Ferrés-Padró *et al.,* 2009; Çelikoğlu *et al.,* 2010; Demiriz *et al.,* 2015). In some cases, the supernumerary teeth may appear in different forms such as single, double, or multiple, which will be unilaterally or bilaterally located and may be associated with complications (Moore *et al.,* 2002; Rajab and Hamdan, 2002; Ferrés-Padró *et al.,* 2009; Demiriz *et al.,* 2015).

Although the main causes of supernumerary teeth are not well known, but many types of research proposed that it developed due to

hyperactivity or horizontal proliferation of the dental lamina (Rajab and Hamdan, 2002; De Oliveira *et al.,* 2008; Ferrés-Padró *et al.,* 2009; Demiriz *et al.,* 2015). The supernumerary teeth are located in a different region of the oral arch. Still, they mostly appear between two central teeth followed by molar, lateral incisor teeth of the maxillary region. The mandibular region mostly appeared around the premolar and molar teeth (De Oliveira *et al.,* 2008; Kara et al., 2012; Demiriz *et al.,* 2015).

The supernumerary teeth may be morphologically classified according to their shape into conical, tuberculate, supplemental, and odontomatous (which may be either erupted or impacted) and they causes some complications such as failure of eruption, displacement, crowding, diastemas, development of odontogenic cyst, and resorption of neighboring teeth (De Oliveira *et al.,* 2008; Kara et al., 2012; Demiriz *et al.,* 2015). The positions of supernumerary teeth were located using radiological examinations. The treatment options of supernumerary teeth include clinical follow-up for a particular period, surgical removal, and orthodontic intervention were used to treat supernumerary teeth complications (De Oliveira *et al.,* 2008; Esenlik et al., 2009; Kara et al., 2012; Martínez-González *et al.,* 2012; Demiriz *et al.,* 2015).

The supernumerary teeth lead to different complications such as uneruption, delayed eruption, ectopic eruption, displacement, diastemas, occlusal problems, rotated neighboring teeth, radicular resorption, etc cyst formation. Although, sometimes the supernumerary teeth are asymptomatic and cannot be diagnosed without examination if there location is not in the oral and maxillofacial region (Zilberman *et al.,* 1992; De Oliveira *et al.,* 2008; Mevlut*et al.,* 2010; Kara *et al.,* 2012; Mali *et al.,* 2012; Fidele *et al.,* 2016).

The occurrence of supernumerary teeth varies according to race, ethnicity, and geographical location. To the best of our knowledge, no study has been carried to assess the occurrence of supernumerary teeth in this region. The present study aim to evaluate the occurrence and complications of supernumerary teeth among people living in Gombe State, Nigeria.

MATERIALS AND METHODS

Sampling

The total number of 300 children and adults consists of an equal number of males (n-150) and females (n=150) attending dental clinic specialist hospital Gombe for different reasons of dental complications and a routine dental check-up. The age's ranges from 5 – 76 years were randomly selected for this research, after been informed about the research.

Procedure for Data Collection

Initially, the basic information, which includes: Age, Gender, Address, and Date of birth, were recorded. The subject was allowed to sit on a chair under sunlight and open their mouth; the dental examination was carried out using a mouth mirror, hand gloves, and a blunt probe. The teeth were cleaned of food debris with cotton wool for proper visibility.

All the observed supernumerary teeth were classified into location (anterior or posterior part of maxilla or mandible), position (vertical, horizontal, angled or inverted), morphology (conical, tuberculated, supplemental or odontoma), and eruption (erupted or unerupted). The clinical

complications and treatment protocols were also observed.

Data Analysis

The data obtained were subjected to a Chi-squared test to determine differences in supernumerary teeth distribution. The data analysis was carried out using SPSS software version 20.0. The confidence interval of 95% ($P \leq 0.05$) was considered statistically significant.

RESULTS

The total number of subjects used for this study was 300 patients diagnosed with supernumerary teeth, among which 150 were males (50 %), and 150 were females (50 %). The subjects' age ranges from 5 - 76 years with the mean age of (18 ± 4) years. Out of which, 346 supernumeraries were discovered. 171 (49.6 %) were discovered from males, and 175 (50.4 %) were from females Table 1.

Table 1: The distribution of supernumerary teeth according to gender

Gender	Number	No. of patients with ST	Number of ST	DF	P-vale
Male	150 (50 %)	150 (50 %)	171 (49.6 %)	1	0.0001
Female	150 (50 %)	150 (50 %)	175 (50.4 %)	1	0.0001
Total	300 (100 %)	100 (100 %)	346 (100 %)		

Key: ST = Supernumerary teeth, Chi-square = 2.536

The prevalence of supernumerary teeth was found to be 5.2% among which the incisor was the most prevalent with 3.39 % (n = 194), then premolars with (0.75 %; n = 43), then canines with (0.46 %; n = 27), then molars with (0.42 %; n = 24). The deciduous teeth were observed with (0.20 %; n = 12) as shown in Table 2.

Table 2: The distribution of supernumerary teeth according to the type of impaction

ST	Male	Female	No. of patients	Prevalence	DF	P-value
Incisors	109	61	194	3.39	1	0.017
Canines	11	19	27	0.46	1	0.004
Premolars	15	41	43	0.75	1	0.001
Molars	9	21	24	0.42	1	0.004
Deciduous teeth	6	7	12	0.20	1	0.004
Total	150	150	300	5.2		

Key: ST= Supernumerary teeth, No. = Number, Chi-square = 6.421

Table 3 shows that the supernumerary teeth frequency was high in maxillar (89.9 %; n = 311) than mandible (10.1 %; n = 35) and more in female (50.6 %; n = 175) than male (49.4 %; n = 171). The prevalence of supernumerary teeth was significantly higher in female (P = 0.03). A significant difference was also found between the maxilla and mandible (P = 0.01).

Table 4 shows that the frequency of supernumerary teeth is higher in children between 5 - 10 years (61.4%; n = 212) than in young adolescents between 11 - 16 years (25.6%; n = 88).

Table 5 shows the orientation of supernumerary teeth, in which 65.7 % (n= 227) are vertically oriented, 18.3 % (n=63) are angular oriented, 8.6 % (n= 30) are transverse oriented and 7.4 % (n= 26) are inverted, which is statistically significance as P-value = 0.001.

Table 3: The distribution of supernumerary teeth according to gender and location.

ST	ML	FM	Total	Maxilla	Mandible
CI	97 (28.0 %)	60 (17.3%)	157 (45.3 %)	147 (42.5 %)	9 (2.6 %)
LI	24 (6.9 %)	16 (4.6 %)	40 (11.5 %)	36 (10.4 %)	4 (1.2 %)
CN	14 (4.0 %)	22 (6.4 %)	36 (10.4 %)	33 (9.5 %)	3 (0.9 %)
PM	17(4.9 %)	48 (13.9 %)	65 (18.8 %	57 (16.5 %)	8 (2.3 %)
ML	11 (3.2 %)	21 (6.0 %)	32 (9.2 %)	23 (6.6%)	9 (2.6 %)
DT	8 (2.3 %)	8 (2.3 %)	16 (4.6 %)	15 (4.3 %)	1 (0.3 %)
TOTAL	171 (49.4 %)	175 (50.6 %)	346 (100 %)	311 (89.9 %)	35 (10.1 %)

Key: ST= supernumerary teeth, ML= male, FM= female, CI= central incisors, LI= lateral incisosr, CN= canine, PM= premolars, ML= molars, DT= deciduous teeth.

Table 4: The distribution of Supernumerary teeth according to ages.

Age Group	St	Percentage	DF	P-Value
5 – 10	212	61.4	1	< 0.001
11– 16	88	25.6	1	< 0.001
17 – 22	13	3.8	1	0.001
23 – 28	17	4.9	1	0.001
29 – 34	3	0.8	1	0.003
35 – 40	2	0.6	1	0.002
41– 46	2	0.6	1	0.002
47– 52	5	1.4	1	0.004
53 – 58	2	0.6	1	0.002
≥58	1	0.3	1	0.002
TOTAL	346	100		

Key: ST = Supernumerary teeth, Chi-square = 6.253

Table 5: The distribution of Supernumerary teeth according to orientation.

Orientation of ST	No. of Teeth	Percentage	DF	P-value
Vertical	227	65.7	1	0.001
Angle	63	18.3	1	0.001
Transverse	30	8.6	1	0.001
Inverted	26	7.4	1	0.001
Total	346	100		

Key: ST= supernumerary teeth, NO. = number, Chi – square = 38.55

Table 6 shows the number of supernumerary teeth in each patient, in which 86.3 % 9 (n= 259) of the patients were observed with one supernumerary tooth, 12.3 % (n=37) of the patients were observed with two supernumerary teeth, and 1.3 % (n=4) of the patients were observed with multiple supernumerary teeth**.**

Table 7 shows the state of supernumerary eruption within the arch, in which 124 of the supernumerary teeth (35.8 %) had erupted and 222 supernumerary teeth (64.2 %) were impacted.

Table 8 shows the supernumerary teeth complications, in which 211 (61.1 %) did not cause any complication, while 108 teeth (31.1%) caused teeth impaction and 27 teeth (7.8%) caused adjacent teeth displacement.

Table 6: The distribution of supernumerary teeth according to number

ST No.	Patients No.	Percentage	No. of teeth	Percentage	DF	P-value
1	259	86.3	259	74.9	1	0.001
2	37	12.3	75	21.7	1	0.001
≥3	4	1.4	12	3.4	1	0.001
Total	300	100	346	100		

Key: ST= supernumerary teeth, NO = number, Chi-square = 3.546

Table 7: The distribution of Supernumerary teeth according to eruption

ST status	Number of teeth	Percentage	DF	P-value
Impacted	222	64.2	1	0.002
Erupted	124	35.8	1	0.003
Total	346	100		

Key: ST= supernumerary teeth, Chi-square = 2.583.

Table 8: The distribution of supernumerary teeth according to complications

ST complication	No. of Teeth	Percentage	DF	P-value
Asymptomatic	211	61.1	1	0.002
Impacted	108	31.1	1	0.002
Crowding	27	7.8	1	0.002
Total	346	100		

Key: ST= supernumerary teeth, Chi-square = 5.674.

DISCUSSION

The prevalence of supernumerary teeth was reported by different researchers among different racial and ethnic groups. The prevalence of supernumerary teeth was reported to be about 1% - 3% in the Caucasian population; it was found to be greater than 3% in Asians and about 0.42 % to 5.6 % in Africa (Tay *et al.,* 1984; Celikoglu *et al.,* 2010). This study discovered the supernumerary teeth prevalence among Gombe state population to be 5.2 %, in which the incisor presented 3.39 %. This finding disagreed with previous findings (Patil and Maheshwari, 2014; Ferres-Padro et al., 2019) due to the differences in demographic and environmental factors and different sample sizes, which may have an impact on the reported prevalence rate (Patil and Maheshwari, 2014; Ferres-Padro et al., 2019). Also, the included population in the previous studies was only the children and young population, but this study included different ages, which range from 5 to 76 years old.

The present study finds the incidence of supernumerary teeth to be significantly higher in females than in males ($p<0.001$). This disagreed with the previous studies (Liu *et al*., 2007 and Esenlik *et al*., 2009) and may be due to a difference in the ratio of male to female. The ratio in the previous study was between 1.18:1 to 4.5:1, whereas in the present study, the ratio was 1:1. This study ratio was found to diverted from other studies, such as of the one by Liu *et al*. (2007) for the Chinese population with a ratio of 2.64:1 (male/female), the study of Esenlik *et al*. (2009) for Turkish population with the ration of (1.13:1), the study of Rajab and Hamdan (2002) the ratio was (2.2:1) and the study by Çelikoğlu (2010) whose ratio was 1.8:1 for the male to female respectively. The male to female ratio of 6.5:1 was used in a different study of Chinese children by Davis (1987).

In the present study, the supernumerary teeth were found to be more frequent in the age group between 5 - 10 years (61.4 %; n = 212), followed by the age group between 11 - 16 years (25.6 %; n = 88). This result was supported by a number of previous research who reported that the supernumerary teeth were mostly observed between the age group of 7 and 10 (Rajab and Hamdan. 2002; Mukhopadhyay, 2011). Esenlik *et al*. (2009) also reported in their study that most cases of supernumerary teeth were found between the ages of 7-9. Many studies reported that supernumerary teeth' most common location is the premaxilla (Esenlik *et al*., 2009; Mukhopadhyay, 2011). This agreed with our study, which finds the premaxillary regions as the predominant location of supernumerary teeth, and 50.9% of these teeth were mesiodens. This is supported by studies of Backman and Wahlin, 2001 and Montenegro *et al.,* 2006. This situation usually leads to complications of mesiodens, which can be easily diagnosed by the parents.

The present study finds the supernumerary teeth' location to be 90 % (n = 311) in the maxillary arch. These results agreed with that of De Oliveira *et al.,* 2008, who reported that 91.3% of the supernumerary teeth were found in the maxillary arch (De Oliveira *et al.,* 2008). Our results were also in agreement with that of Hattab *et al.* (1994) and Zhu *et al.* (1996), who reported that 90% of supernumerary teeth were found in the maxillary bone. The incisor (56.8 %; n = 197) was the most commonly appearing supernumerary teeth with high frequency in the central incisor (45.3 %; n = 157). This agreed with the studies by Hyun *et al*. (2009) and Dermiriz *et al*. (2015). The present study discovered the prevalence of supernumerary teeth in the deciduous teeth to be 4.6 %, which varies from findings by others authors who had shown that the prevalence of supernumerary teeth ranges from 0.2% to 0.8% in the deciduous dentition (Rajab and Hamdan, 2002; Gábris *et al.,* 2006).

According to our finding, 74.9 % (n = 259) of the supernumerary teeth were single, 21.7 % (n = 75) were double and 3.4% (n=12) were multiples of supernumerary teeth. Our findings coincide with previous studies who reported that the supernumerary teeth are more frequently single, while multiple supernumerary teeth are normally two in number (Rajab and Hamdan, 2002; De Oliveira Gomes *et al.,* 2008; Çelikoğlu *et al.,* 2010). This is because the supernumerary teeth may occur in either single or multiples number in any region. Still, it is well known that multiple supernumerary teeth rarely co-exist without any diseases or syndromes. The study finds that 35.8% (n = 124) of the supernumerary teeth erupted. Our results were close to other studies by Rajab and Hamdan, (2002); Esenlik *et al.,* (2009); Mukhopadhyay, (2011) and Demiriz *et al.,* (2015) who reported that all supernumerary teeth mostly erupted. We also verified that erupted supernumerary teeth were vertically oriented, 65.7% (n = 227). This is supported by studies of (Rajab and Hamdan, 2002; Esenlik *et al.,* 2009; Mukhopadhyay, 2011; Demiriz *et al.,* 2015), who reported that all the supernumerary teeth were normally vertically orientated while none of the transverse or inverted supernumerary teeth were erupted. Our study finds that displacement (38.9%) as the most frequent clinical complication of the supernumerary teeth. This was supported by the report of (Rajab and Hamdan, 2002; Esenlik *et al.,* 2009; Mukhopadhyay, 2011; Anthonappa *et al.,* 2012).

CONCLUSION

The occurrence of supernumerary teeth in the Gombe region was higher, and it is more frequent in children with ages ranges between 5 to 10 years. This is followed by the young adolescent population from 11 to 16 years old. Its frequency is more in the permanent incisor of the maxillary region. Most of the supernumerary teeth are singly erupted and asymptomatic, even though some of them are accompanied by some complications such as impaction, crowding, and displacement. The detection of supernumerary teeth is essential. The early diagnosis helps to prevent or minimize possible complications.

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