Research Article

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Sex Difference in The Occurrence of Supernumerary Teeth Among People Living in Gombe State, Nigeria

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Abstract

The present study is aimed to evaluate sex difference in the occurrence of supernumerary teeth among people living in Gombe State Nigeria. The total number of 300 individuals with equal number of males (n=150) and females (n=150) with ages ranges from 5-78 years that are attending 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 sun light, 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 Chi-squared test in order to obtain sex differences in supernumerary teeth distribution using SPSS version 20.0 software (IBM Corporation, USA). The result shows that there is 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 find that the frequency of supernumerary teeth was higher in children (5-10 years), which is more around the incisor of the maxillary region with the females having the highest frequency than males, in which most of them are singly erupted and asymptomic, although some of them are accompanied by some symptoms like impaction, crowding and displacement.

Keywords: sex; 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; Rayyanu *et al.*, 2020). 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; Rayyanu *et al.*, 2020; Rayyanu *et al.*, 2020). 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; Rayyanu *et al.*, 2020).

Although the main causes of supernumerary teeth are not well known, but many researches 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; Rayyanu *et al.*, 2020). The supernumerary teeth are located in different region of the oral arch, but they are mostly appeared between two central teeth followed by molar, lateral incisor teeth of the maxillary region, in the mandibular region it mostly appeared around the premolar and molar teeth (De Oliveira *et al.*, 2008; Kara et al., 2012; Demiriz *et al.*, 2015; Rayyanu *et al.*, 2020).

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; Rayyanu *et al.*, 2020). 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; Rayyanu *et al.*, 2015; Rayyanu *et al.*, 2020).

The supernumerary teeth lead to different complications such as un eruption, delayed eruption, ectopic eruption, displacement, diastemas, occlusal problems, rotated neighboring teeth, radicular resorption and cyst formation. Although, sometimes the supernumerary teeth are asymptomatic and cannot be diagnosed without examination if their 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; Rayyanu *et al.*, 2020).

The occurrence of supernumerary teeth varies according to race sex, ethnicity and geographical location. To the best of our knowledge no study has been carried in order to assess sex difference in the occurrence of supernumerary teeth in this region.

The present study is aimed to evaluate the sex difference in occurrence of supernumerary teeth among people living in Gombe State Nigeria.

Materials And Methods

Sampling

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

Procedure of Data Collection

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

All the observed supernumerary teeth were classified in to 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 obtained data were subjected to Chi-squared test in order to determine sex differences in supernumerary teeth distribution. The data analysis was carried out using SPSS software version 18.0. The confidence interval of 95% ($P \le 0.05$) was considered statistically significance.

Result

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

| Gender | Number | NO. of patients with ST | Number of ST | |
|--------|-------------|-------------------------|--------------|--|
| Male | 150 (50 %) | 150 (50 %) | 171 (49.6 %) | |
| Female | 150 (50 %) | 150 (50 %) | 175 (50.4 %) | |
| Total | 300 (100 %) | 100 (100 %) | 346 (100 %) | |

Table 1: the distribution of supernumerary teeth according to gender.

Key: ST = Supernumerary teeth

The prevalence of supernumerary teeth was found to 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 was observed with (0.20 %; n = 12) Table 2.

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

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

Key: ST= Supernumerary teeth, No.= Number,

Table 3 shows that the supernumerary teeth frequency was high in maxilla (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 3: The distribution of supernumerary teeth according to sex 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 incisors, CN= canine, PM= premolars, ML= molars, DT= deciduous teeth.

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

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|-----------|----------------|----------------------------|
| AGE GROUP | ST | PERCENTAGE |
| 5-10 | 212 | 61.4 |
| 11–16 | 88 | 25.6 |
| 17 – 22 | 13 | 3.8 |
| 23 - 28 | 17 | 4.9 |
| 29 - 34 | 3 | 0.8 |
| 35 - 40 | 2 | 0.6 |
| 41-46 | 2 | 0.6 |
| 47-52 | 5 | 1.4 |
| 53 - 58 | 2 | 0.6 |
| ≥58 | 1 | 0.3 |
| TOTAL | 346 | 100 |

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

Key: ST= supernumerary teeth

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.

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

| Orientation of ST | NO. of Teeth | Percentage |
|-------------------|--------------|------------|
| Vertical | 227 | 65.7 |
| Angle | 63 | 18.3 |
| Transverse | 30 | 8.6 |
| Inverted | 26 | 7.4 |
| Total | 346 | 100 |

Key: ST= supernumerary teeth, NO. = number

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 6: The distribution of supernumerary teeth according to number.

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

Key: ST= supernumerary teeth, NO= number

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.

ST statusNumber of teethPercentageImpacted22264.2Erupted12435.8

100

Table 7: The distribution of Supernumerary teeth according to eruption.

346

Key: ST= supernumerary teeth.

Total

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.

| ST complication | Teeth number | Percentage |
|-----------------|--------------|------------|
| Asymptomatic | 211 | 61.1 |
| Impacted | 108 | 31.1 |
| Crowding | 27 | 7.8 |
| Total | 346 | 100 |

| Table 8: | The distribution of | of supernumerary | teeth according to | complications. |
|-----------|---------------------|-------------------|--------------------|----------------|
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Key: ST= supernumerary teeth.

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 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).

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

This study discovered the supernumerary teeth prevalence among Gombe state population to be 5.2 % in which the incisor presented 3.39 %. This finding was in disagreement with previous findings due to the differences in demographic and environmental factors and different sample size which may have 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 ranges from 5 to 76 years old.

In the present study the supernumerary teeth were found to be more frequent in age group between 5 - 10 years (61.4%; n = 212), followed by age group between 11 - 16 years (25.6%; n = 88). This result was supported 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 his study that most cases of supernumerary teeth were found between the ages of 7-9.

Many studies reported that the most common location of supernumerary teeth is the premaxilla (Esenlik *et al.*, 2009; Mukhopadhyay, 2011). This agreed with our study, which find the premaxillary regions as the predominant location of supernumerary teeth and 50.9% of this teeth were mesiodens, this is supported by studies of Montenegro *et al.* and Bäckman and Wahlin (Backman and Wahlin, 2001; Montenegro *et al.*, 2006). This situation usually leads to complications of mesiodens which can be easily diagnosed by the parents.

The present study find the location of the supernumerary teeth to be 90 % (n = 311) in the maxillary arch. These results agreed with that of De Oliveira *et al.* who reported that 91.3% of the supernumerary

teeth were found in the maxillary arch (De Oliveira *et al.*, 2008). Our results was 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 is in agreement with the studies by Hyun *et al.* (2009) and Dermiriz *et al.* (2015).

The present study discovered the provalence of supernumerary teeth in the deciduous teeth to be 4.6 %, which varies from findings by others authors who had showed 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 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 due to the fact that the supernumerary teeth may occur in either single or multiples number in any region, but it is well known that, multiple supernumerary teeth co-exist rarely without any diseases or syndromes.

Our study find that 35.8% (n = 124) of the supernumerary teeth were erupted. Our results were close to other studies by (Rajab and Hamdan, 2002; Esenlik *et al.*, 2009; Mukhopadhyay, 2011; Demiriz *et al.*, 2015) who reported that all supernumerary teeth were 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 find that the displacement (38.9%) as the most frequent clinical complication of the supernumerary teeth. This was supported by report of (Rajab and Hamdan, 2002; Esenlik *et al.*, 2009; Mukhopadhyay, 2011; Anthonappa *et al.*, 2012).

Conclusions

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 young adolescent population between 11 to 16 years old. Its frequency is more in the permanent incisor of the maxillary region with the females having the highest frequency than males. Most of the supernumerary teeth are singly erupted and asymptomic, even though some of them are accompanied by some complications such as impaction, crowding and displacement. The detection of supernumerary teeth is very necessary. The early diagnosis helps to prevent or minimize possible complications.

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