Tooth Morphological Variations in Crown & Root among Dental Graduates in Lucknow – A Descriptive Cross Sectional Study.

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ABSTRACT :

Background: Morphological variations in crown and root are one of the common finding in dentistry. Many people are unaware of these variations because it does not cause any pain and discomfort and people usually cause concerns for these variations only if it affects aesthetics or masticatory functions. These variations usually pose a problem in endodontic orthodontic treatments.

Aims and objectives: To assess the common morphological variations in dental Crown & Root among dental students.

Methods: A detailed clinical examination, radiographic examination &interpretation was carried out among 200 subjects in a private dental institution in Lucknow. The subjects were divided into 4 groups based on their geographical location within Lucknow. The subjects were made to sit comfortable on a dental chair in an upright position, and the examiners toped on the right hand side of the patient during examination. The data extracted were tabulated, statistically analyzed and results are obtained. Results were calculated on the basis of frequency and percentages using SPSS.

Results: Result of the present study shows that 39% of study subjects had Cusp of carabelli traits, 20 % of study subjects had 6th cusp, 6% of study subjects had protostylid and 2 % of study subjects had parastylid. In addition 3.5 % of study subjects had Dental caries and and 1.5% of study subjects had dentinal hypersensitivity as associated problems.

Conclusion: Many of the crown morphological variations like protostylid, accessory cusps, interruptions grooves have evident clinical Implication which should be corrected at earliest.

Keywords: Tooth variation, Protostylid, Cusp of carabelli, Accessory cusp,

INTRODUCTION

Morphological variations in crown and root are one of the common finding in dentistry. Many of the crown morphological variations like protostylid, accessory cusps, interruptions grooves are accidentally found clinically or radiographically and may have evident clinical Implication[1].

Radiography plays a major role in detecting these morphological variations Which are not visible clinically. Prevalence of morphological in crown and root in higher in Indian population but very few studies have been done in this regard[1].

Researcher in several disciplines, including physical anthropology , archeology, paleontology, dentistry, genetics, embryology, and forensic science, conduct research that falls directly or indirectly within the province of dental anthropology."[1]

Many so-called non-metric dental traits, extra cusps on certain teeth, variations, in Ridge form, or different groove patterns, have been defined and described in

human Populations. It has been suggested that these traits may prove to be useful than tooth size Data in establishing genetic relationships between populations because they are so numerous and lend to be genetically independent.

They also seem to be characters are carabelli trait, casp 6, cusp 7, protostylids, shoved shaped incisors and groove pattern of molars[2].

People are unaware of these variations because it does not cause any pain and discomfort unless if it affects aesthetics or masticatory functions. These variations pose a problem in endodontic orthodontic treatments[3].

Literature review reveals that there are only few studies are done in this regard and few case reports are published. So this study aims at evaluating the prevalence of different Types of morphological variations in crown and root in dental students by clinical and Radiographic evaluations.

AIM & OBJECTIVES

- To assess the most common morphological variations among study subjects.
- To assess the gender predilection for particular morphological variations.
- To assess the side predilection for morphological variations.
- To correlate the ethnicity with morphological variation.

METHODOLOGY

The present cross sectional study is an attempt to assess the various types and most prevalent morphological variations in crown and root among study subjects in private dental institution in Lucknow. The sampling method is of convenience sampling. The final sample size was 200. The study subjects are divided into four groups based on geographical location from Gomti nagar , Kaiserbagh, Aishbagh, Charbagh.

Clinical examination was carried out among study subjects who were selected randomly in department of Oral Medicine and Radiology. The subjects were made to sit comfortably on a dental chair in an upright position, the examiners toped on the right hand side of the patient during examination.

A formal ethical clearance was obtained by the Ethical committee of the institute. The subjects were explained in the detail about the condition affecting their oral cavity and the procedure that they would be subjected to and a written consent was sought from all of them. Study frame included questionnaire with different types of questions.

Morphological variations were further sub-classified like Protostylid, Parastylid, Cusp 6, Supernumerary cusp, Cusp of carabelli, shoveling, and winged incisor and also one patient having more than one variation in the oral cavity or having two variations in a single tooth were recorded on a Preforma.

Both clinical and radiographic evaluation of patients was done for the final diagnosis. The radiographic modalities used for the study are Intra oral periapical radiograph and Orthopanatamogram.Photographs were taken for each variation using digital camera.

INCLUSION CRITERIA:

- All dental students between the age group of 18-25 years

- Patients who were advised radiographs as a part of their dental investigatory procedure.
- Both genders are included.

EXCLUSION CRITERIA:

- Subject having any traumatic injury.
- Subjects with positional dental anomalies and development dental anomalies.
- Subjects with developmental dental anomalies associated with syndromes were excluded.

Proper history with emphasis on family history and complete clinical examinations was done for proper evaluation of variations.

Data collected and descriptive statistics were prepared using Microsoft excel 2007 version.

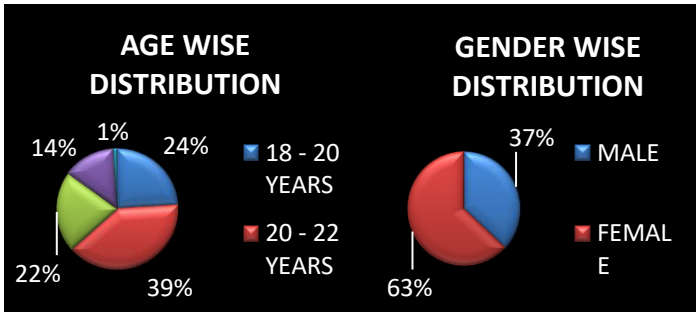
The data obtained was coded and fed into the SPSS (Statistical Package for Social Sciences) version 17 for analysis and categorical data were presented as number and percentages by using contingency tables and continuous data as mean and standard deviation. Data was analyzed using Chi-square test and all statistical tests were performed at 95% confidence interval. A p value less than 0.05 was considered as statistically significant.

RESULTS

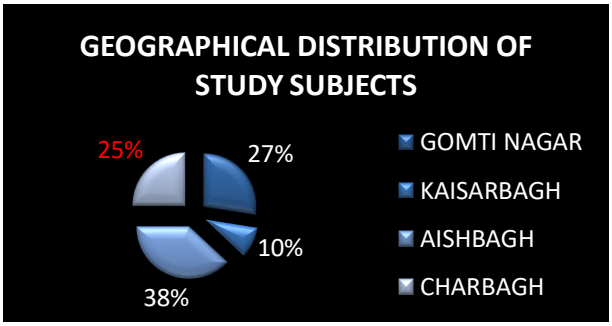
The results of the present study in shows the various types of morphological variation in crown and root and the most prevalent morphological variation among study subjects in Lucknow population. The study is divided into four groups based on geographic location within Lucknow population from Gomti nagar , Kaiserbagh, Aishbagh, Charbagh.

The study subjects were divided into five age groups from 18 – 20 years, 20 – 22 years, 22 – 24 years, 24 – 26 years, and 26 – 30 years. Pie Chart 1 Shows the age wise distribution of study subjects.

Among 200 study subjects 74 were males and 126 were females. Pie chart 2 shows the gender wise distribution of study subjects.Among 200 Study Subjects 42 of them stated that their parents had consanguineous marriage.



PIE CHART 1 – AGE WISE DISTRIBUTIONPIE CHART 2 – GENDER WISE DISTRIBUTION

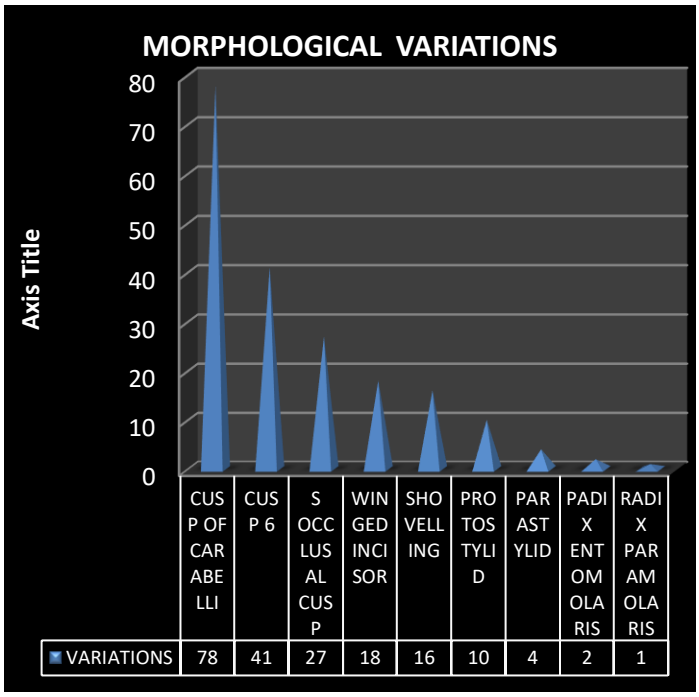


PIE CHART 3 SHOWS THE STUDY SUBJECTS FROM FOUR GROUPS BASED ON THEIR GEOGRAPHIC LOCATION

MORPHOLOGICAL VARIATIONS

The descriptive statistics of present study shows thatout of 200 study subjects 10 of them had protostylid, 4 of them had parastylid, 27 of them had S occlusal cusp, 18 of them had winged incisors, 16 of them had shoveling, 41 of them had cusp 6, 78 of them had Cusp of carabelli trait, 3 of them had Radix

Entomolaris and 1 subject had Radix Distomolaris. Out of 200 study subjects 197 of them had morphological variation.



GRAPH 1 – DESCRIPTIVE STATISTICS OF MORPHOLOGICAL DISTRIBUTIONSIDE WISE DISTRIBUTION OF MORPHOLOGICAL VARIATIONS

Among the 10 subjects who had Protostylid 4 of them had in left side quadrant and 6 of them had in right side quadrant. Among the 4 subjects who had parastylid 2 of them had in left side quadrant and 2 of them in right side quadrant.

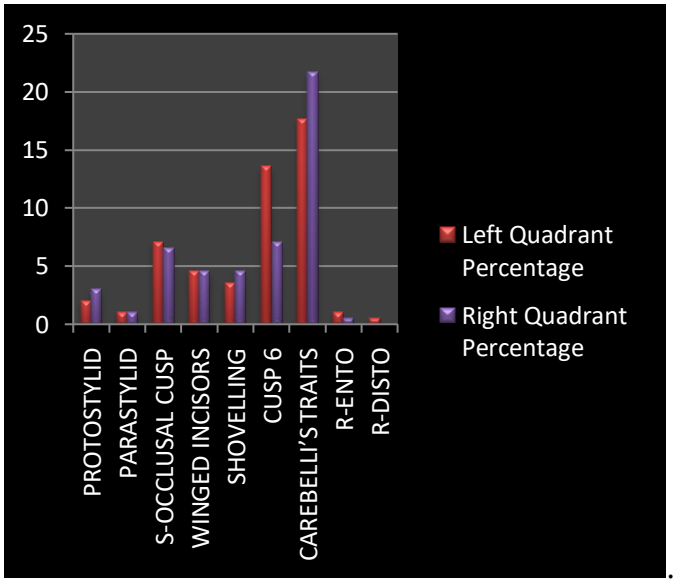
Among the 27 subjects who had S Occlusal cusp 14 of them had in left side quadrant and 13 of them in right side quadrant.Among the 18 subjects who had winged incisor 9 of them had in left side quadrant and 9 of them in right side quadrant.

Among the 16 subjects who had shovelling 7 of them had in left side quadrant and 9 of them in right side quadrant.Among the 41 subjects who had cusp 6 27 of them had in left side quadrant and 14 of them in right side quadrant

Among the 78 subjects who had cusp of carabelli 35 of them had in left side quadrant and 43 of them in right side quadrant. 2 Radix Entomolais in left side was seen whereas 1 on right side was seen.

Maximum variations were observed in left quadrant with 51.01%. Crown variations of Carabelli's trait was with the maximum number with 39% more in right quadrant. Graph 2 shows the side wise predilection of dental morphological variation.

All these findings were found to be statistically no significant (p Value - 0.341)



GRAPH 2 – SIDE WISE PREDILECTION GEOGRAPHICAL LOCATION & MORPHOLOGICAL DISTRIBUTION

Among 55 subjects from ***Gomti Nagar*** 1 of them had protostylid, 1 of them showed had parastylid, 14 of them had winged inciseor, 2 of them had winged incisor, 2 of them had shoveling, 15 of them had cusp 6 and 11 of them had cusp of carabelli. Depicts various morphological variations in Gomti Nagar,

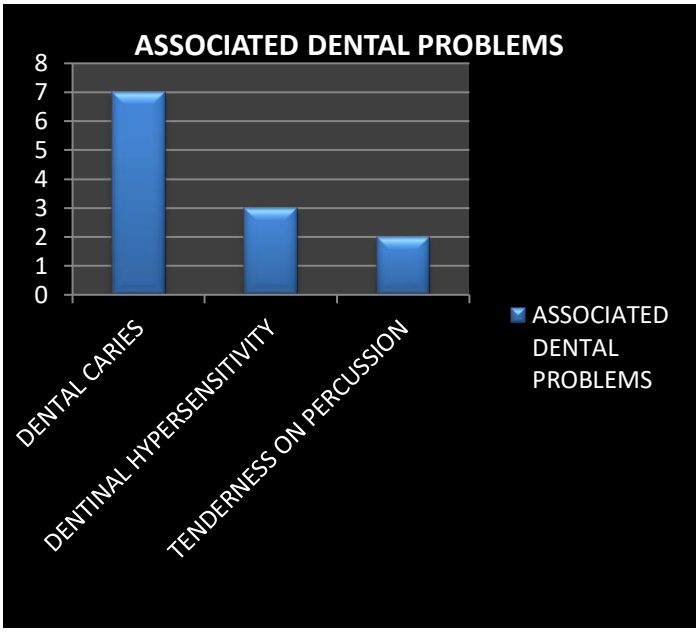
maximum of cusp 6 was observed which more on left side.

Among 19 subjects from ***Kaisarbagh*** 1 of them had protostylid, 1 of them showed had parastylid, 2 of them had winged inciseor, 4 of them had winged incisor, 3 of them had cusp 6 and 4 of them had cusp of carabelli.Depicts various morphological variations in Kaisarbagh, which showed maximum number of Carebella's trait, more in right quadrant

Among 76 subjects from ***Aishbag***h 1 of them had protostylid, 1 of them showed had parastylid, 2 of them had winged incisor, 4 of them had winged incisor, 3 of them had cusp 6 and 4 of them had cusp of carabelli. This depicts various morphological variations in Aishbagh, which revealed maximum number of carabelli's trait, more in the right quadrant.

Among 50 subjects from ***Charbagh*** 5 of them had protostylid, 1 of them showed had parastylid, 2 of them had winged inciseor, 6 of them had winged incisor, 2 of them had shoveling, 06 of them had cusp 6 and 22 of them had cusp of carabelli. Morphological variations in Charbagh maximum of carabelli's trait is observed, more in right quadrant.

12 subjects who had morphological variation also had associated dental problems like Dental caries, Dentinal hypersensitivity, Tenderness on precision. Graph 3 shows the percentage of subjects who had associated problems. All these findings were found to be statistically no significant (p Value - 0.421).

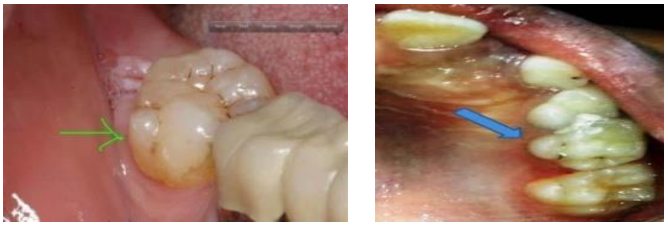


GRAPH 3 – ASSOCIATED DENTAL PROBLEMS

DISCUSSION

Morphological variations are relatively uncommon and occur as isolated condition with no association with any functional disturbances[10]. These variations often exhibit various patterns. Very few studies have been done to know the exact prevalence of these morphological variations. Hence our study was designed to know the prevalence of these variations among students of different regions and make them aware of dental problems associated with them[4].

In the present study, 21 % of study subjects gave a positive history of consanguineous marriage. The results are in accordance with Berquist et al where in they reported 24% of positive consanguinity [4]. The results are in contrast with ***Carolina et al*** where in they reported 58 % of positive consanguinity [5]



PROTOSTYLID CARABELLI TRAIT WINGED INCISOR CUSP 6

The protostylid trait has been regarded as a characteristic feature of the Mongoloid dentition with prevalence of 40% according to ***J. Rocha et al*** who conducted a study in 2007. In the present study 3.03% had protostylid. The results are in accordance with ***L. Aguirre et al***[6]

In the present study 15% had supernumerary occlusal cusps. The results are in accordance with ***Merrill et al*** where in they reported 17 % prevalence[7].

In the present study there was 4.55% prevalence of bilateral winging.The results are contrast to reports to be fairly common among the America Indians, with a prevalence of 41.5% in the Makiritare Indian, 49% in the Zunis and 52.75% in the Yanomama Indian, the South American groups such as the Prewenche, the Diaguitas, and the Jivars exhibit a prevalence of winging of 55.5%, 66.2% and 50-70 respectively.[8]

In the present study there was 21 % prevalence of cusp of carabelli. The results are in accordance with ***Alvesalo et al***where in they reported 24 % prevalence.[9]

The present study showed minimum number of radix-entomolaris and radix paramolaris. They were more in left quadrant than right quadrant. Equal sex distribution was observed with maximum number in Charbagh. Both had prevalence rate of 1%. Many of the subjects in our study included more than one morphological variation, which showed a figure of 20 out of 200 subjects, which was not significantly a high number.

The most commonly observed morphological variation was cusp of Carabelli, followed by cusp 6 which were 41 in number, supernumerary occlusal cusp, then winged incisors which were 18, shoveled incisors, protosylids, parastylid, lastly, radix entomolaris and paramolaris[10].

LIMITATIONS & CONCLUSION

- The sample size should have been taken on large scale for more accurate results.
- Equal distributions of the subjects based on gender distribution should have done for better results.
- Grading of morphological variations should have been analyzed.
- Tooth number associated with each variation should have been documented and statistically analyzed.

Results of the present study show that the dental morphological variations pose minor dental ailments in both aesthetic and functional problems. It also shows that there is a need to provide formal and obligatory education about various morphological variations and its complications.

Based on the mentioned shortcomings and limitations, further research should be made in order to screen and diagnose dental morphological variations at community level screening

REFERENCES

1. Scoot CR. Turner CG. The anthropology of modern human teeth dental morphology and its variation in recent human populations. Combridge: Combridge, Universtiy Press' 1997.
2. Diseases of the tropics, chapter 5-Anthropological aspects of dental morphology with special reference to tropical populations by Grant. C. Townsend.

3. Teaford, MF, Smith MM, Ferguson MMJ. Development, function and evolution of teeth. Is ted. Cambridge: Cambridge University Press, 2000.

4. Bergquist L.P. The Role of teeth in mammal history. Braz J Oral Sci, July September 2003, 2(6)249-257.

5. Carolina R, Freddy M. Paramolar tubercle in the left maxillary second premolar' a case report. Dental Anthropology. 2006;9(3)65-69.

6. Aquirre Lm, Castillo D, Solarte D, Moreno F. Frequency and Variability of live non-metric dental crown trains in the primary and permanent dentitions of a racially mixed population from Cali, Colombia. Dental Andropology 2006;19(2): 39-47.

7. Oehless F, The tubercualted premolar. Dent Prac Dent Rec. 1956:144

8. Bilateral accessory central cusp of 2nd deciduous molar; an unusual occurrence. S. Nagarajan M.P, Sockalingam,. Alida Mahyuddin, Archives of Orofacial Science. 2009;4(1)22-24

9. Townsend GC, Richards L, Hughes T. Molar intercuspal dimensions; Genetic input to phenotypic variations. J Dent Res. 2003; 82: 350-355.

10. Morena SM, Moreno F. Eigjht Non-Metric dental traits in alive racially mixed population from Cali. Colombia. Inter J Dental Anthropol 2005;6:14-25

How to cite this Article:

Narang D, Singh P, Kaur R, Kaur P, Pushpa, Singh A. Tooth morphological variations in crown & root among dental graduates in lucknow – a descriptive cross sectional study. Journal of Interdisciplinary Dental Sciences. 2021; July-Dec 10(2):01-07

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