

ORIGINAL ARTICLE

Co-Relation of Gingival Biotype (Periodontal Phenotype) with Width of Keratinized Gingiva in Maxillary Anterior Teeth in Patients Reporting to a Local Tertiary Care Dental Hospital

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ABSTRACT

Objective: To find out the correlation of gingival biotype with width of keratinized gingiva in maxillary anterior teeth in patients at tertiary care dental hospital presenting for routine periodontal care.

Materials And Methods: In this cross-sectional study, a total of 87 patients were observed in department of Periodontology, Fatima Memorial Hospital College of Medicine and Dentistry Lahore. The gingival biotype (gingival thickness) were determined by using the transparency of the periodontal probe through gingival sulcus. The width of the keratinized gingiva was measured by measuring the distance between the most coronal point of the gingival margin and the mucogingival junction measured at the midpoint of the vestibular face of the teeth using a Michigan O periodontal probe with William's markings.

Results: In this study mean age was 38 years with SD \pm 10.88. Forty six percent patients were male and 54% patients were female. Mean width of keratinized gingiva was 4.22mm \pm 1.10 while mean gingival biotype was 1.5 mm \pm 0.65. The correlation coefficient $r=0.277$ shows a positive correlation of width of keratinized gingiva with gingival biotype

Conclusion: The study concluded that there is a positive correlation of gingival biotype with width of keratinized gingiva in maxillary anterior teeth.

Keywords: gingival biotype, width of keratinized gingival, maxillary anterior teeth

INTRODUCTION

The beauty of smile is characterized by the harmony of teeth, gingiva and extra oral tissues. Gingival display in the maxillary anterior teeth is more apparent as compared to the posterior teeth.¹ The pioneering work on gingival biotypes was done by Ochsenbein and Ross who identified two main types of gingival morphology namely the scalloped or thin and flat or thick gingiva. Seibert and Lindhe coined the term "periodontal biotype" and classified gingiva into "thick flat" and "thin scalloped" biotypes. Later on the term gingival biotype was used to describe the thickness of gingiva in facio-palatal dimensions.² In the 2017 classification of Periodontal and peri-implant disease and conditions the term gingival biotype has been replaced by "Periodontal Phenotype".¹

In order to distinguish a thick from thin gingiva a guiding criteria needs to be established. Several methods have been used to differentiate thin from thick gingiva including: direct measurement, ultrasonic device, cone beam computed tomography and probe transparency through the free gingiva.³ The use of probe transparency through the gingival margin is an accurate and simple method to discriminate thick from thin gingiva⁴. No statistically significant difference was observed when assessment using a periodontal probe was compared to direct measurement.⁵

Width of keratinized gingiva is defined as the distance between gingival margin and the mucogingival junction measured at the midpoint of the vestibular face of the tooth.⁶

In a systematic review Cosyn et al. concluded that a thick gingival biotype may contribute to minimize the frequency of advanced recession following immediate

implant treatment.⁷ In a study by Shah et al. prevalence of thick and thin biotypes was found to be 56.75% versus 43.25% respectively while demonstrating no significant relationship between age, gender, and the presence of gingival recession to gingival biotype. However they found a positive correlation between gingival thickness and width of keratinized gingiva for maxillary canine, lateral incisor and central incisor.²

Egreja et al. found a positive co-relation between gingival thickness and width of keratinized tissue for the maxillary right canine, lateral incisor and central incisor in patients aged 20-35 years.⁶ However, a study by Abraham S et al. suggested that thick biotype is present in 85% of the population as compared to 15% thin biotype.⁸ Uniform positive associations were found only between gingival thickness, keratinized tissue and bone morphotype.⁹

Although width of keratinized gingiva exhibits no racial variation, racio-ethnic variations do occur in gingival biotype.¹⁰ Both the factors has been shown to influence the outcome of restorative therapy and periodontal health and there are fewer studies showing their correlation in specific racio-ethnic population, the rationale of this study is to find out the relationship of gingival biotype with width of keratinized gingiva in patients reporting to a tertiary care dental hospital using a non- invasive and cost effective technique.

METHODOLOGY

The present study was conducted at department of Periodontology, Fatima memorial Hospital College of medicine and dentistry Lahore, from 28th September 2018 to 28th March 2019. In this study a total of 87 patients aged 18-50 years of both genders having no attachment loss

were included in the study. Subjects having clinical attachment loss or Periodontal pockets of more than 3mm, patients with gingival enlargement, crowded teeth, fixed prosthesis in maxillary anterior teeth, missing teeth in anterior maxilla, pregnant patients, using medications having effect on Periodontal tissues, and/or history of surgery in anterior maxilla were excluded from the study. A detailed history followed by clinical examination of the patient was performed to select patient according to inclusion and exclusion criteria. The Periodontal Phenotype (gingival thickness) were determined by using the transparency of the periodontal probe through gingival sulcus. The width of the keratinized gingiva was measured by measuring the distance between the most coronal point of the gingival margin and the mucogingival junction measured at the midpoint of the vestibular face of the teeth using a Michigan O periodontal probe with William's markings. The data was collected using a customized proforma which collected the patient's biographical data in addition to the study variables. Assessment of both gingival biotype and width of keratinized gingiva was performed by the same examiner to address any bias. The collected data was analyzed using Statistical Package for Social Sciences (SPSS) version 17. Frequency and percentages was calculated for categorical variables like gender and gingival biotype (thick and thin). Mean +SD was calculated for numerical variables like age and width of keratinized gingiva. Pearson correlation coefficient test were applied to see relationship between gingival biotype and width of keratinized gingiva. All the results were presented in the forms of table and charts. Data was stratified for age & gender, chi square test was used post stratification with a P value ≤ 0.05 considered as significant

RESULTS

In this study a total of 87 patients were observed in which age distribution was analyzed as 12(14%) patients were in age 18-25 years and 75(86%) patients were in age range 26-50 years, Mean age was 38 years with SD ± 10.88 .

Table no 1. Age distribution (n=87)

AGE	FREQUENCY (%age)
18-25 years	12(14%)
26-50 years	75(86%)
AGE	
Mean \pm SD	38 \pm 10.88

Gender distribution was analyzed as 40(46%) patients were male while 47(54%) patients were female.

Table no 2. Gender distribution (n=87)

Gender	Frequency(%age)
Male	40(46%)
Female	47(54%)

Status of gingival Biotype was analyzed as 50(58%) patients had thick gingival biotype while 37(42%) patients had thin gingival biotype.

Table no 3. Periodontal phenotype (n=87)

PHENOTYPE	Frequency(%age)
Thick (> 1 mm)	50(58%)
Thin (< 1 mm)	37(42%)

Correlation of width of keratinized gingiva with gingival biotype was analyzed as mean width of keratinized gingiva in thick gingival biotype was 4.69 mm while mean width of keratinized gingiva in thin gingival biotype was 3.22 mm. the correlation coefficient $r = 0.341$ shows a positive correlation of width of keratinized gingiva with gingival biotype.

Table no 4. Correlation of width of keratinized gingiva with gingival biotype (n=87)

	BIO TYPE		r
	Thick (> 1 mm)	Thin (< 1 mm)	
Width of keratinized gingiva	4.69 mm	3.22 mm	0.341

DISCUSSION

Our study shows that a total of 87 patients were observed in which mean age was 38 years with SD ± 10.88 . Forty six percent patients were male and 54% patients were female. Mean width of keratinized gingiva in thick gingival biotype was 4.69 mm while mean width of keratinized gingiva in thin gingival biotype was 3.22 mm. The correlation coefficient $r = 0.341$ shows a positive correlation of width of keratinized gingiva with gingival biotype.

In another study conducted by Egreja et al⁶ had reported a positive co-relation between gingival thickness and width of keratinized tissue for the maxillary right canine (Pearson $r = 0.398$ $P < 0.05$), lateral incisor (Pearson $r = 0.369$, $P < 0.05$) and central incisor (Pearson $r = 0.492$, $P < 0.05$) in patients aged 20-35 years.

Another study conducted by Abraham S et al⁸ had reported that thick biotype is present in 85% of the population as compared to 15% thin biotype. Uniform positive associations were found only between gingival thickness, keratinized tissue and bone morphotype.

In the present study, keratinized gingival width of the maxillary anterior teeth was found between 3.29 \pm 2.12 mm and 7.21 \pm 2.07 mm

Our study concludes that there is a positive correlation of gingival biotype(Phenotype) with width of keratinized gingiva in maxillary anterior teeth.

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