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Prevalence of gingival biotype in accordance with age and gender in Kashmiri population

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Abstract
Background: The purpose of the present study was to identify the existence of gingival biotypes in a sample of healthy volunteers and correlate the prevalence of different gingival biotypes of upper anteriors, in accordance with age, gender.
Methodology: 45 subjects (27males and18 females) with age groups of 20‑35 years, 36‑50 years were included in this study. Probe transparency method was adopted to assess the biotype at the midfacial aspect of the maxillary incisors and the canines bilaterally.
Results: The association of age and gingival biotype was not significant. Study showed that thick biotype decreased with advancing age. The association of sex and gingival biotype was not significant in relation to 11, 12, 21 and 22 but significant in relation to 13 and 23. Among the female subjects, the prevalence of thick biotype in relation to 11, 12, 21 and 22 was less than males, whereas in relation to 13 and 23 the prevalence of thick biotype was high in females.
Conclusion: These findings can be utilized for determining the gingival biotype and response of gingiva to dental operative procedures.

Keywords: Gingival thickness, thick biotype, thin biotype, periodontal probe

Introduction
Gingival biotype refers to the quality of the soft tissue profile surrounding the teeth; it has significant impact on the outcome of restorative treatments. The term (gingival biotype) was introduced to describe the thickness of the gingiva in a bucco-lingual dimension (thick or thin) [1]. Various studies have shown a wide range of clinical difference in form and appearance in tissue biotypes in individuals. Different factors contribute to these differences including genetics, tooth morphology, tooth position, age, gender and growth [2]. Ochsenbein and Ross (1969) divided gingival anatomy into pronounced scalloped and flat biotype [3]. Later in 1986 Claffey and Shanley defined the thin tissue biotype as a gingival thickness of ≤1.5 mm, and thick tissue biotype was referred to as having a tissue thickness ≥2 mm [4]. In a study by De-Rouck *et al*. (2009), the thin gingival biotype associated with slender tooth form occurred in one third of the study population and was prominent among women, while thick gingival biotype which was associated with square teeth form occurred in two-thirds of the study population and occurred mainly among men [5]. Thin biotype is delicate and more prone to recession, bleeding and inflammation [6]. Thereis significant impact of gingival architecture on the outcome of treatments. Therefore, gingival biotype should be evaluated at the beginning of the treatment plan for the most esthetic results.
There are various methods to evaluate the gingival tissue form like visual inspection, ultrasonic devices, Trans gingival probing and cone beam computerized tomography imaging. The aim of this study is to evaluate the gingival biotypes in in accordance with age and gender in kashmiri population.

Methodology
The present study was conducted among the outpatients in the Department of Prosthodontics, Government Dental College & Hospital, Srinagar, Kashmir. The purpose of the present study was to identify the existence of gingival biotypes in a sample of periodontally healthy volunteers and correlate the prevalence of different gingival biotypes of upper anteriors in accordance with age, gender.

In this study, the probe transparency method was adopted Using a metal periodontal probe to evaluate gingival tissue thickness is the simplest way to determine gingival biotype. With a thin biotype, the tip of the probe is visible through the gingiva. This method is minimally invasive, and periodontal probing procedures are performed routinely during periodontal and implant treatments.

45 subjects (27males and18 females) with age groups of 20‑ 35 years, 36‑ 50 years were included in this study. The participants were made to sign an informed consent form.

Inclusion criteria: Healthy periodontal tissues in the presence of bilateral maxillary central and lateral incisors and canines were included in the study.

Exclusion criteria: Subjects on medication which affects the periodontal tissues such as cyclosporin A, calcium channel blockers, and phenytoin, pregnant or lactating mothers, history of orthodontic therapy and prosthetic restorations.

The clinical evaluation of gingival biotype of the bilateral maxillary incisors and canines were determined using a UNC-15 periodontal probe (HuFreidye, USA) for each of the subjects. The biotype was assessed by probing the gingival sulcus at the midfacial aspect of the maxillary incisors and the canines. The gingival biotype was then categorized as either thick or thin according to the visibility of the underlying periodontal probe through the gingival tissue.

The gathered data were analyzed using Chi-square test. $P < 0.05$ was considered statistically significant.

Results

The study sample consisted of 45 subjects, who were stratified into two different age groups of 20–35 years and 36–50 years of age groups. Among them, 76 (52.4%) were in the age group of 20–35 years and 69 (47.6%) were in the 36–50 years age group. Of the total population 27 (60%) were males and 18 (40%) were females.

The distribution of subjects according to age and gingival biotype is given in Tables 1 and 2.

The distribution of subjects according to sex and gingival biotype is given in Tables 3 and 4.

Table 1: The distribution of subjects according to age and gingival biotype [11‑13].

Age	11		12		13	
	Thin (%)	Thick (%)	Thin (%)	Thick (%)	Thin (%)	Thick (%)
20-35	5 (11.1)	21(46.6)	9(20)	12(26.6)	15(33.3)	9(20)
36-50	5(11.1)	19(42.2)	10(22.2)	14(31.1)	13(28.8)	8(17.7)
Total	10(22.2)	40(88.8)	19(42.2)	26(57.7)	28(62.2)	17(37.7)
p	0.535		0.477		0.266	

Table 2: The distribution of subjects according to age and gingival biotype [21‑ 23].

Age	11		12		13	
	Thin (%)	Thick (%)	Thin (%)	Thick (%)	Thin (%)	Thick (%)
20-35	3(6.66)	20(44.4)	11(24.4)	14(31.1)	14(31.1)	11(24.4)
36-50	4(8.88)	18(40)	9(20)	11(24.4)	12(26.6)	8(17.7)
Total	7(15.5)	38(84.4)	20(44.4)	25(55.5)	26(57.7)	19(42.2)
p	0.451		0.447		0.142	

Table 3: The distribution of subjects according to sex and gingival biotype [11‑ 13].

Age	11		12		13	
	Thin (%)	Thick (%)	Thin (%)	Thick (%)	Thin (%)	Thick (%)
Male	3(6.66)	22(48.8)	9(20)	19(42.2)	23(51.1)	4(8.88)
Female	4(8.88)	16(35.5)	10(22.2)	17(37.7)	15(33.3)	3(6.66)
Total	7(15.5)	38(84.4)	19(42.2)	36(80)	38(84.4)	7(15.5)
p	0.407		0.701		0.05	

Table 4: The distribution of subjects according to sex and gingival biotype [21‑23]

Age		11		12		13
	Thin (%)	Thick (%)	Thin (%)	Thick (%)	Thin (%)	Thick (%)
Male	3(6.66)	24(53.3)	9(20)	16(35.5)	21(46.6)	5(11.1)
Female	2(4.44)	16(35.5)	8(17.7)	12(26.6)	15(33.3)	4(8.88)
Total	5(11.1)	40(86.9)	17(37.7)	38(84.4)	36(80)	9(20)
p	0.381		1.00		0.05	

The association of age and gingival biotype was not significant in relation to 11, 12, 13, 21, 22, and 23. The study showed that thick biotype decreased with advancing age.

The association of sex and gingival biotype was not significant in relation to 11, 12, 21, and 22 but significant in relation to 13 and 23 as cervical one-third of the tooth is more prominent.

Among the female subjects, the prevalence of thick biotype in relation to 11, 12, 21, and 22 was less than males, whereas in relation to 13 and 23 the prevalence of thick biotype was high in females [Figures 1 and 2].

Discussion

The gingival perspective of esthetics is concerned with soft tissue covering around the teeth. Gingival morphology plays an important role in determining the final esthetic outcome; therefore, during treatment it is important to recognize gingival biotypes. Gingival biotype helps in better determination of the treatment outcome in various branches of dentistry and is important in clinical practice.

Gingival thickness is assessed by an invasive and a non-invasive method. Invasive methods such as injection needle or probe while non-invasive methods included visual

examination, the use of ultrasonic devices, probe transparency and cone beam computed tomography (CBCT) [5, 8, 9]. The visual assessment of the gingival biotype by itself is not sufficiently reliable and may not be considered as a valuable method as previous studies have found [7, 10]. The ultrasonographic method of assessing gingival thickness is a non-invasive method [11]. The CBCT measurements were found to be an accurate representation of the clinical thickness of both labial gingiva and bone. However, exposure to radiation and cost makes it less desirable [12]. The transparency of a periodontal probe was chosen as it is considered atraumatic, rapid and with relatively low cost. Furthermore, this method was found to be an easy, reproducible, reliable and an objective method [7]. In our study, there is prevalence of thick gingival biotype. This finding is consistent with previous studies in which they found that thick gingival biotype was more prevalent among their sample populations [1, 13].

Clinical appearance of healthy periodontium differs from subject to subject. Many features are genetically determined few are influenced by tooth size, shape and position and aging. Age groups of 20–35 years, 36–50 years were included in this study because as age progresses periodontal condition deteriorates.

This study was done bilaterally from central incisor to canine whereas several studies have been done unilaterally and on central incisors [10, 11].

In the age group of 20–35 years, it was found that 52.4% of individuals have thin gingival biotype. Patients with a thin biotype are more vulnerable to connective tissue loss and epithelial damage, thus they need special atraumatic treatment and oral hygiene techniques. Thin gingival biotypes are less stable, and the occurrence of the papillary and marginal recession is more common in them. Hence, more caution should be exercised while planning a subgingival margin placement or crown lengthening for patients with a thin biotype [12].

The thicker biotype of tissue form is dense and fibrotic with a wider zone of attached gingiva, thus making them more resistant to gingival recession [4]. This type of tissue prevents mucosal recession, hides the restorative margins.

In the present study, the prevalence of thick biotype in relation to 11, 12, 21, and 22 was more in males than females, whereas in relation to 13 and 23 the prevalence of thick biotype was high in females. A study by Abraham and Athira [11] observed that the male population had thicker gingival biotype to be more prevalent (74%) while compared to thin form (26%). A similar result was reported by De Rouck *et al*. [14] wherein, the thin gingival biotype occurred in one-third of the study population and was most prominent among women, while the thick gingival biotype occurred in two-thirds of the study population and occurred mainly among men. Shah *et al*. [15] found no significant association between the gender.

Conclusion

Within the limitation of the present study, following conclusion were drawn:

The thicker biotype is more prevalent in male population while the female population consists of thin, scalloped gingival biotype.

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