

# The Evaluation of Prevalence, Extension and Severity of Gingival Recession among Rural Nepalese Adults

Dr Manoj Humagain,<sup>1</sup> Dr Dashrath Kafle<sup>2</sup>

<sup>1</sup>Asst Professor, Dept of Periodontology, <sup>2</sup>Asst Professor, Dept of Orthodontics  
Kathmandu University School of Medical Sciences, Dhulikhel, Nepal

Correspondence: [mhumagain@hotmail.com](mailto:mhumagain@hotmail.com)

## ABSTRACT

**Introduction:** Gingival recession is the location of marginal periodontal tissues apical to the cemento-enamel junction, which can lead to many clinical problems. The prevalence, extension and severity of gingival recession present considerable differences among various study populations.

**Objective:** To assess the prevalence, extension and severity of gingival recession among rural Nepalese adults.

**Materials & Method:** The study was performed on 246 adult dentate rural patients above 20 years of age having at least 24 natural teeth. The prevalence, extension and severity of gingival recession were assessed by a single examiner using William's graduated periodontal probe. Type and severity of gingival recession was recorded by using Miller's criteria of apico-coronal height of recession defects.

**Result:** Gingival recession was present in 65.44 % of the total study sample and mean number of teeth with gingival recession was 9.77. The prevalence of gingival recession was 41.37%, 58.90%, 77.41% and 86.79% in age groups of 20-29 years, 30-39 years, 40-49 years and  $\geq$  50 years respectively. In younger age groups Class I gingival recession was more prevalent whereas Class III and Class IV gingival recession was more prevalent in older age groups. Mandibular central incisors were the teeth most frequently affected by gingival recession (7.3%).

**Conclusion:** 9.64% of teeth were affected by severe form of gingival recession at the age group 20-29 years as compared to 48.09 % at the age groups more than 50 years. High prevalence of gingival recession in adult subjects provides information about the importance of diagnosis and knowledge on these pathological gingival changes.

**Key words:** apico-coronal, extension, prevalence, recession, severity

## INTRODUCTION

Gingival recession is defined as location of marginal periodontal tissues apical to cemento-enamel junction.<sup>1</sup> Recession may be localized to one tooth, or a group of teeth, or may be generalized throughout the oral cavity.<sup>2</sup> It may be associated with apical shift of marginal gingiva on one or more surfaces resulting in clinical attachment loss and root exposure that can lead to clinical problems such as root surface sensitive to hot and cold, caries, cervical root abrasions, erosions, plaque retention and aesthetic concern to the patient. Several factors play role in recession development such as excessive or inadequate teeth brushing, destructive periodontal disease, tooth malpositioning, alveolar

bone dehiscence, thin marginal tissue covering a non-vascularized root surface, shallow vestibule, inadequate width of attached gingiva, frenal pull and trauma from occlusion.<sup>3</sup>

Despite common observation in adults; the prevalence, extension and degree of severity of gingival recession present considerable differences among various study populations. Prevalence indicates number of cases or occurrences of gingival recession; extension corresponds to the number of teeth affected by gingival recession; and severity signifies the total root surface exposed by the gingival recession, i.e. the linear apico-coronal height of the gingival recession.

The proportion of subjects with gingival recession increases with age;<sup>4,5,6,7,8</sup> the incidence varies from 8% in children to 100% after the age of 50 years.<sup>9</sup> As the incidence and severity of recession increases with age, some investigators assumed that recession may be a physiologic process related to aging. However, convincing evidence for a physiologic shift of the gingival attachment has never been presented.<sup>2</sup> The gradual apical shift of marginal gingiva is most probably the result of the cumulative effect of minor pathologic involvement and/or repeated minor direct trauma to the gingiva, or may be the result of increasing periodontal disease in some population without access to dental care.<sup>10</sup>

Many epidemiologic studies have been conducted on prevalence and severity of gingival recession on western population. According to US National Survey,<sup>11</sup> 88% of seniors (aged 65 years and above) and 50% of adults (18 to 64 years) present recession in one or more sites; progressive increase in frequency and extent of recession is observed with increase in age. The prevalence varied from 50-90% among these populations. In Norway<sup>12</sup> 51% of adults aged 18 years and above had gingival recession, while similar studies among adults in Iraq<sup>13</sup> and Finland<sup>14</sup> displayed gingival recessions in 73% and 68% subjects respectively. Similarly, gingival recession was observed in 53.5 % Greek adults,<sup>15</sup> 76% Indian samples<sup>16</sup> and 60.5 % Yemeni adults.<sup>17</sup>

Periodontal disease is more common in developing countries than in developed countries. Since recession is one of the characteristic features of periodontal disease, its prevalence and severity is of great concern. The aim of this study was to assess the prevalence, extent and severity of gingival recession among rural Nepalese patients.

## MATERIALS AND METHOD

The study sample comprised of 246 adult subjects aged above 20 years randomly selected from the patients attending diagnosis and treatment camps organized by Department of Dentistry, Kathmandu University Teaching Hospital at Kushadevi VDC of Kavre district on 16<sup>th</sup> March 2013. The participants were divided into following four groups according to age range:

Group 1	20 - 29 years	58 patients
Group 2	30 - 39 years	73 patients
Group 3	40 - 49 years	62 patients
Group 4	> 50 years	53 patients

The selection criteria comprised of age above 20 years with minimum number of 24 natural teeth present excluding third molars. The participants were evaluated by a single examiner to avoid inter-examiner variations. The sample included 137 male and 109 female, adding up to 6,731 teeth for examination. William's graduated periodontal probe was used for the measurement of apico-coronal height of gingival recession, which was recorded when greater than 1 mm of root surface was exposed. Four surfaces were evaluated on each tooth: mesial, buccal, distal and lingual. Linear measurements were obtained from the cemento-enamel junction to the gingival margin of the teeth presenting with gingival recession in order to evaluate the apico-coronal height of the gingival recession. In cases where cemento-enamel junction was covered by calculus or hidden by a restoration or lost due to caries or cervical abrasion; the location of such junction was estimated on the basis of adjacent tooth.

### Miller's Classification of gingival recession

<b>Class I</b>	Marginal tissue recession without extending to the muco-gingival junction without loss of bone or soft tissue in the interdental areas
<b>Class II</b>	Marginal tissue recession that extends to or beyond the muco-gingival junction without loss of bone or soft tissue in the interdental areas
<b>Class III</b>	Marginal tissue recession that extends to or beyond the muco-gingival junction in addition there is bone and/or soft tissue loss in the interdental areas and/or mild malocclusion
<b>Class IV</b>	Marginal tissue recession that extends to or beyond the muco-gingival junction with severe bone and/or soft tissue loss in the interdental areas and/or severe tooth malposition

Three categories were established according to apico-occlusal dimension of the root surface exposed by gingival recession; small recessions: less than 3 mm of root surface exposed; moderate recessions: 3 to 4 mm of root surface exposed; advanced recessions: more than 4 mm of root surface exposed to the oral environment. Gingival recession was recorded according to P.D. Miller's classification<sup>18</sup> of marginal tissue recession.

## RESULTS

The study revealed gingival recession in 161 subjects out of 246, which is 65.44% of the total sample examined. Among 6731 teeth of the 246 subjects examined; 2404 displayed gingival recession corresponding to 35.72% of the total teeth examined. Among all subjects mean number of teeth with gingival recession was 9.77 and gingival recession was observed in 4336 sites with the mean number of sites of gingival recession per subject as 17.63 (Table 1).

Prevalence of gingival recession increased with age. Among the study sample, the prevalence of gingival recession was 41.37%, 58.90 %, 77.41% and 86.79% in age groups of 20-29 years, 30-39 years, 40-49 years and  $\geq$  50 years respectively. Increase in age also led to increase in the mean number of teeth with gingival recession. The mean number of teeth with gingival recession at the age group above 50 years (63.94%) was

significantly higher than that of age group 20-29 years (10.28%). Similarly the extension of gingival recession was also found to be increased with age. The mean number of teeth with gingival recession per subject at 20-29 years age group (2.86) was significantly less than at the age groups above 50 years (17.26) (Table 1).

Among age groups 20-29 and 30-39 years, Class I gingival recession was more prevalent i.e. 80.12% and 78.46% respectively whereas Class III and Class IV gingival recessions were more prevalent in older age groups (Table 2). Only 1.20% of subjects of age groups 20-29 had Class IV gingival recession as compared to 40.11% at the age groups above 50 years. At the older age groups more than 50 years; Class III and Class IV gingival recessions were 39.12% and 40.11% respectively, whereas only 12.79% subjects had Class II gingival recession and 7.98% subjects had Class I gingival recession (Table 2). Among all teeth examined, mandibular central incisors were the teeth most frequently affected by gingival recession (7.3%) followed by maxillary first molars, second premolars and first premolars. Maxillary incisors and second molars were least affected by gingival recession (Table 3). Similarly the severity of gingival recession (based on apico-coronal height of recession) increased with age. Only 9.64% of teeth were affected by severe form of gingival recession ( $>$  4 mm) at age group 20-29 as compared to 48.09% at the age groups above 50 years (Table 4).

**Table 1: Prevalence and extension of gingival recession according to age group**

Age Group (years)	Total no. of teeth	Prevalence		Extension		
		No. of Subjects with GR	No. of teeth with GR	Mean no. of teeth with GR/subject	No. of sites with GR	Mean no. of sites of GR/subject
20- 29 (N=58)	1615	24 (41.37%)	166 (10.28%)	2.86	186	3.2
30- 39 (N=73)	1988	43 (58.90%)	520 (26.16%)	7.12	857	11.73
40- 49 (N=62)	1697	48 (77.41%)	803 (47.32%)	12.95	1427	23.02
$\geq$ 50 (N=53)	1431	46 (86.79%)	915 (63.94%)	17.26	1866	35.21
Total (N=246)	6731	161 (65.44%)	2404 (35.72%)	9.77	4336	17.63

**Table 2: Scoring of the severity of gingival recession based on Miller's classification**

Age Group (years)	Severity of Gingival Recession				Total
	Class I	Class II	Class III	Class IV	
	No. of teeth	No. of teeth	No. of teeth	No of teeth	
20- 29	133 (80.12%)	23 (13.86%)	8 (4.82%)	2 (1.20%)	<b>166</b>
30- 39	408 (78.46%)	63 (12.12%)	37 (7.11%)	12 (2.31%)	<b>520</b>
40- 49	185 (23.04%)	241 (30.01%)	254 (31.63%)	123 (15.32%)	<b>803</b>
≥ 50	73 (7.98%)	117 (12.79%)	358 (39.12%)	367 (40.11%)	<b>915</b>
<b>Total</b>	<b>799 (33.24%)</b>	<b>444 (18.47%)</b>	<b>657 (27.33%)</b>	<b>504 (20.96%)</b>	<b>2404</b>

**Table 3: Intraoral distribution of gingival recession**

%	2.4	4.6	4.3	4.2	3.3	1.7	2.2	2.2	1.6	3.4	4.5	4.1	4.5	2.3	45.3
Teeth No. (FDI)	17	16	15	14	13	12	11	21	22	23	24	25	26	27	Total %
	47	46	45	44	43	42	41	31	32	33	34	35	36	37	
%	1.9	3.4	2.8	2.8	3.5	5.7	7.3	7.3	5.6	3.4	2.7	2.9	3.6	1.8	54.7

**Table 4: Severity of gingival recession according to age groups**

Age group (Years)	No of teeth with GR < 3 mm	No of teeth with GR 3-4 mm	No of teeth with GR > 4 mm	Total
<b>20-29</b>	119 (71.69%)	31 (18.67%)	16 (9.64%)	166
<b>30-39</b>	322 (61.92%)	127 (24.43%)	71 (13.65%)	520
<b>40-49</b>	208 (25.90%)	231 (28.77%)	364 (45.33%)	803
<b>≥ 50</b>	54 (5.90%)	421 (46.01%)	440 (48.09%)	915

## DISCUSSION

The result of the present study corroborates previous findings of the common occurrence of gingival recession in adult subjects. This study confirms that the prevalence and severity of gingival recession increase with age; which is consistent with most of the epidemiological studies on several age groups.<sup>10,19,20,21,22</sup> This study reports 161 (65.44%) subjects found to be affected with gingival recession which is consistent with several other related studies,<sup>16,17,21</sup> and the prevalence is slightly higher than the findings of some other studies.<sup>3,12,22</sup> Other studies reported the prevalence of gingival recession ranging from 22.5% to 27.7%.<sup>5,23</sup> The relationship between increased prevalence of gingival

recession and age could be due to the cumulative effect of age, periodontal disease and longer period of exposure to the agents that cause gingival recession.

The extension of root surface exposure due to the apical shift of marginal gingiva defines severity of gingival recessions.<sup>24,25,26</sup> Miller<sup>18</sup> suggested the classification of gingival recession based on extension of recession defects and the extent of hard and soft tissue loss surrounding the gingival recession defects. For Millers' class versus age group; our study shows that Millers' Class I was associated with the largest number of cases having gingival recessions in the sample. Class III and Class IV gingival recessions; which are considered as the most severe forms of gingival

recession were increasingly prevalent in older subjects. Similar findings were also seen in the previous studies of gingival recession.<sup>17,21,27</sup>

The present study demonstrated higher prevalence of gingival recession in mandibular teeth (54.70%) as compared to maxillary teeth (45.30 %); which is in agreement to the findings of previous studies.<sup>14,16,27</sup> However, study report by Gorman<sup>19</sup> contradicts this result with the reverse findings showing higher prevalence in maxillary teeth (56%). Lower occurrence of gingival recessions in maxillary teeth is probably related to the characteristics of keratinized mucosa, which is wider and thicker in maxilla than in the mandible.<sup>28</sup> In agreement to several other studies, no differences were observed in the occurrence of gingival recession between right and left sides.<sup>14,16,27</sup>

In our study, mandibular central incisors displayed the highest frequency of gingival recession (7.3%). Besides, mandibular lateral incisors, premolars, maxillary and mandibular first molars were also commonly affected. Many recent epidemiological studies on distribution of gingival recession also demonstrated similar findings.<sup>3,15,29</sup> However, no consensus is observed in the literature in regards to the teeth most frequently affected by gingival recession. Some indicated maxillary canines and premolars,<sup>19,30</sup> other mentioned maxillary premolars and molars<sup>8,26</sup> as the most frequently affected teeth by gingival recession. A

study done by Crysanthakopoulos<sup>15</sup> on Greek adults found that maxillary and mandibular first and second molars were the most frequently affected tooth by gingival recession. In agreement to the findings of other epidemiological studies, the present study also yields the finding that the severity of gingival recession based on apico-coronal height of recession increases with age.<sup>15,16,27</sup>

## CONCLUSION

Gingival recession was observed in 65.44% of the sample and 35.71% of the total teeth examined among Nepalese rural subjects. The mean number of teeth and mean number of sites with gingival recession and the severity of the gingival recession based on the apico-coronal height of recession are directly proportional to the age of the subject. Mandibular central incisors were the teeth most frequently affected by gingival recession. Greater prevalence, extension and severity of gingival recession observed in older subjects suggest the cumulative effect of the lesion associated with longer period of exposure to the etiologic agents. Timely identification of condition and removal of the etiology is necessary to reduce or avoid such gingival alteration. More analytic and longitudinal study with larger sample size is required to elucidate the finding of the present study.

**OJN**

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