

A Comparative Study of Oral Hygiene Practices and their Effects on Cleaning Efficiency, Tooth Wear, and Gingival Recession in a Population of Bihar

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Abstract

Background: The maintenance of oral hygiene is critical for anticipation of innumerable oral as well as systemic diseases. Different populations utilize various oral hygiene measures skillfully since the ancient times, such as toothbrushes and dentifrices. **Aims and Objectives:** This study aimed on evaluation and comparison of traditional oral hygiene measures versus the use of toothpaste-toothbrush in plaque-cleaning efficiency, tooth wear, and gingival recession. **Materials and Methods:** This was a cross-sectional study done among the population of small town in Patna district, Bihar, where a total of 250 traditional oral hygiene method users were compared with 250 toothpaste-toothbrush users. **Results:** Among the study groups, patients reported there were maximum tooth powder users (54.4%) compared to other traditional measures such as chew stick (32.8%) and salt/oil. The study group population demonstrated statistically significant ($P < 0.05$) percentage of individuals with poor oral hygiene (36.0%), tooth wear involving dentine (76.8%), and Miller's Class II gingival recession (34.8%). **Conclusion:** Toothpaste-toothbrush was found to be more effective in controlling plaque and occurrence of gingival recession and tooth wear.

Keywords: Gingival recession, OHI(s), Tooth wear, Traditional oral hygiene practices.

INTRODUCTION

Oral health is said to be the mirror of general health. It is vigorous for leading an excellent lifespan. In adults, periodontitis is considered the foremost cause of tooth wearing. India has mixed population; people are practicing different traditional methods for oral hygiene maintenance, such as commercial toothpowders, charcoal- or tobacco-based toothpowders, neem stick (chew stick/miswak), or simply salt and oil by finger method.^[1] Periodontal disease is considered by the loss of supporting tissues of the teeth, which affects patient's health directly.^[2] This is most commonly found in rural and semi-urban areas due to illiteracy and lack of awareness; whereas people belonging to lower socioeconomic groups practice traditional oral hygiene measures due to its lower cost, as these are comparatively cheaper and due to certain misapprehensions concerning their advantageous effects.^[3]

It has been proven that using these products, even for short duration of 6–12 months, had resulted in extreme tooth wear.

This often causes dentinal hypersensitivity and sometimes even pulp exposure. Such patients require widespread treatments such as restorations, endodontic treatments, extractions of teeth and full mouth rehabilitation as per the need. In a few cases, there is requirement of technique-sensitive measures of full-mouth rehabilitation to restore the lost, which is time-consuming, requires multiple sittings, and also economical strengthening.

This paper represents a cross-sectional study to evaluate the influence of these traditional oral hygiene measures on tooth loss, gingival recession, and gingival bleeding in the rural population of Patna district of Bihar.

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MATERIALS AND METHODS

A cross-sectional study was conducted in a camp conducted in small towns in Patna, Bihar. A total of 250 individuals comprised the study group that used traditional oral hygiene methods, and an equal number of individuals using toothpaste and toothbrush were included in the control group. Only patients willing to participate in the study were included. The traditional oral hygiene measures included the use of toothpowder with finger or with toothbrush, with salt/oil, chew sticks (neem/bamboo/miswak), tobacco powder, charcoal powder, etc.

Following criteria were used to access the following oral health parameters: Debris and Calculus - Oral Hygiene Index-Simplified,^[4] Tooth Wear - Tooth Wear Index given by Ganss,^[5] and Gingival Recession - Miller's Classification.^[6] The data collected were subjected to appropriate statistical analysis.

RESULTS

The present study constituted of 500 participants, with 250 participants in the study and control group each. The patient demographics have been tabulated in Table 1. The mean age of the study group participants was 47.6 years, while that for the control group was 39.4 years. The questions about oral hygiene practice revealed that 54.4% of the study group participants used toothpowder with finger, 32.8% participants used chew sticks, and 12.8% participants used other methods (Table 2).

The OHI(s) score was measured and was graded as good (0.0–1.6), fair (1.7–3), and poor (3.1–6) for both the groups and has been tabulated in Table 3. Chi-square test revealed statistically significant differences ($P < 0.05$) between the study and control groups for good and poor OHI(s) scores.

The tooth wear score for both the groups has been tabulated in Table 4. The control group exhibited a higher percentage of individuals with no wear into dentine (26.8%) compared to the study group (10.4%), which was statistically significant ($P < 0.05$). Furthermore, the study group exhibited a higher percentage of individuals with dentine exposed for $<1/3^{\text{rd}}$ surface (43.2%) and dentine exposed to more than $1/3^{\text{rd}}$ surface (33.6%) compared to control group individuals with a percentage score of 35.6% and 22.8% for the same criteria, respectively, which was statistically significant ($P < 0.05$). The percentage of individuals with tooth wear causing exposure into pulp was 12.8% and 14.8% for the study and control groups and was statistically not significant ($P > 0.05$).

The presence/absence of gingival recession in the study population has been tabulated in Table 5. The control group exhibited statistically significant ($P < 0.05$) higher percentage of individuals with no gingival recession (35.6%) and Class-I recession (18.4%) compared to the study group which had 25.6% and 9.6% for the same criteria, respectively. Furthermore, the study group exhibited a higher percentage of individuals with Class-II recession (34.8%) compared to control group (12.8%), which was statistically significant ($P < 0.05$). Statistically insignificant differences ($P > 0.05$)

Table 1: Demographics of the study and control groups

Groups	Mean age (years)	Males (%)	Females (%)
Study group	47.6	146 (58.4)	104 (41.6)
Control group	39.4	127 (50.8)	123 (49.2)

Table 2: Oral hygiene practices by the study and control groups

Oral hygiene practice	Study group (%)	Control group (%)
Toothbrush-toothpaste	0	250 (100)
Tooth powder with finger	136 (54.4)	0
Chew sticks	82 (32.8)	0
Other means	32 (12.8)	0
Total	250 (100)	250 (100)

Table 3: Oral Hygiene Index (simplified) score in the study and control groups

OHI (s) score	Good (0.0–1.6)	Fair (1.7–3.0) (%)	Poor (3.1–6.0) (%)	Total (%)
Study group	84 (33.6%)	76 (30.4)	90 (36.0)	250 (100)
Control group	108 (43.2%)	93 (37.2)	49 (19.6)	250 (100)
P-value	<0.05	>0.05	<0.05	-

Table 4: Tooth wear index in the study and control groups

Tooth wear score	0 (%)	1 (%)	2 (%)	3 (%)	Total
Study group	26 (10.4)	108 (43.2)	84 (33.6)	32 (12.8)	250
Control group	67 (26.8)	89 (35.6)	57 (22.8)	37 (14.8)	250
P-value	<0.05	<0.05	<0.05	>0.05	-

between the study and control groups were seen in Class-III and Class-IV recession.

DISCUSSION

Maintenance of good oral hygiene is essential for effective plaque removal using suitable brushing technique. The present study reported that 54.4% of individuals in the study group used tooth powder in combination with finger, 32.8% of participants used chew sticks, and 12.8% of participants used other methods as their oral hygiene practice. This could be attributed to convenience and low cost of toothpowder and chew sticks. However, the effectiveness of these methods in maintenance of oral hygiene is somewhat outdated.

The chew sticks have a limited ability to clean the interproximal and lingual tooth areas owing to great variations in fiber size that may not bring out best cleansing of such areas.^[7] The present study also reported statistically significant higher percentage of good OHI(s) score for control group and statistically significant higher percentage of poor OHI(s) for study group (Table 3), thus implying the effectiveness of tooth brushes in maintenance of oral hygiene.

Tooth powders (Branded/Red/Charcol/Gul Manjan, etc.) are abrasive and cause more of tooth surface wear compared to

Table 5: Gingival recession in the study and control groups

Groups	No recession (%)	Class-I recession (%)	Class-II recession (%)	Class-III recession (%)	Class-IV recession (%)	Total
Study group	64 (25.6)	24 (9.6)	87 (34.8)	43 (17.2)	32 (12.8)	250
Control group	89 (35.6)	46 (18.4)	32 (12.8)	41 (16.4)	42 (16.8)	250
P-value	<0.05	<0.05	<0.05	>0.05	>0.05	-

toothpaste.^[8] The current study concluded that statistically significant higher percentage of individuals with the absence of tooth wear was seen in control group patients. Furthermore, a statistically significant higher percentage of individuals with wear of <1/3rd dentin and wear of more than 1/3rd dentin was seen in the study group. Some researchers have also concluded that for plaque removal, toothpaste-toothbrush is a very effective method than other traditional measures as they cause increased gingival bleeding and recession.^[9]

Hollist and Khoory concluded that extreme scouring of chew stick and tooth powder lead to abrasion and recession on the anterior teeth resulting in a compromised esthetic zone.^[10,11] Another study by Eid *et al.* concluded that chew stick as one of the etiologies of gingival recession compared to toothbrush users,^[12] which is in accordance to the findings of our study.

Damage to the tooth-supporting structures such as gingival recession, tooth wear, and severe periodontal pockets is mainly due to aggressive, excessive, and improper use of traditional measures, hence can be controlled by educating patients for using proper technique carefully. As the etiology of tooth wear, gingival inflammation, and gingival recession is multifactorial, the exact cause–effect relationship between the use of traditional methods of oral hygiene and harmful effects observed cannot be established.

CONCLUSION

Within the limits of the present study, it can clearly be elucidated that brushing with toothbrush and toothpaste was found to be more effective in controlling plaque and occurrence of gingival recession and tooth wear compared to traditional

oral hygiene practices. The role of dental health education and socioeconomic status also plays an important role in the choice of oral hygiene practice, which can be taken up as another study for the target population of Bihar.

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