

Prevalence of Root Surface Caries, Dental Attrition and Assessment of Oral Hygiene Index in Patients of Three Different Age Groups at Nishtar Institute of Dentistry Multan

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ABSTRACT

Background: Oral hygiene is an important factor in prevention of certain dental and periodontal diseases. Improved oral hygiene is a good reflection of healthy gums and teeth. Root surface caries and the dental attrition are also more common among the young and the elderly patients. The presence of dental attrition and root surface caries along the oral hygiene index is distributed widely among three age groups of the patients.

Objective: To find out the prevalence of root surface caries and dental attrition along their existing oral hygiene status in terms of Oral Hygiene Index (OHI) among three age groups of the patients.

Study Design: Descriptive study

Place of Study: Department of Operative Dentistry, Nishtar Institute of Multan from 1st January 2018 to 31st March 2018.

Materials and Methods: A total of 310 patients were selected and examined randomly at hospital outpatient department. A precise history was taken from the patients. All the patients were categorized in three groups; age group I (21-35 years), age group II (36-50 years) and age Group III (51-65 years). There were three types of categories including root surface caries, oral hygiene index and the dental attrition. All these were to evaluate and assess for their prevalence among three age groups.

Results: The value of α with degree of freedom 4 is 9.488 while our statistics represented 3.2675. So the null hypothesis is accepted. The result is not significant at $p < 0.05$.

Conclusion: The prevalence of root surface caries, dental attrition and oral hygiene index score is common among the three age groups

Key words: Root surface caries, Dental attrition, Oral hygiene index, Periodontitis, Gingival recession

INTRODUCTION

The Prophet Muhammad (ﷺ) said, "There is no disease that Allah (SWT) has created, except that He also has created its treatment." Allah (SWT) has made every disease curable but the ailment of disease is bound in conjunction with the efforts to find out its cure. History reveals that there has been a long relationship existed between mankind and diseases. Man has been facing the diseases since long. There had been certain types of infectious diseases of viral, bacterial and parasitic origin. In past, to cope with these diseases was always a challenge for the curators. The modern advancements in the field of medicine and surgery have, however, paved the way for newer treatment techniques and methodologies resulting in decline of the so many diseases and improving the health status. Dental caries is thought as one of the most common disease of the teeth. The decay of the tooth surface is a bacterial action of acidogenic bacteria on the organic and in organic portion of the tooth surface. This causes the breakdown of tooth surface leading to a cavitations or defect¹⁰. This may further lead to pain and difficulty in mastication.^{1,2}

Dental diseases are widely spread and there are a number patients present in our society having dental problems. The teeth are of much importance for a healthy body. The human teeth are meant for chewing, biting and grinding of food as well as having major function in speech. Root surface caries is considered to be present in the

elderly patients due to the gingival recession on the exposed root surfaces. With the passage of time, there is also wearing of teeth, which is due to tooth-tooth contact during the mastication. This wearing of the tooth surface may sometimes be more pronounced, leading to decreased facial vertical height and pulp horn exposures due to the loss of tooth structure. The human body is comprised of complex organ systems. All these systems are integrated with one another in a precise manner. It is a beautiful example of co ordination between all the systems. The oral hygiene is also a good indicator for certain types of oral pathologies. In fact, it has been an excellent criterion for the judgment of the patient's awareness about the cleaning habits of teeth. When the oral hygiene is improved, definitely it would lead to reduce in certain oral pathological problems. Though the socioeconomic and demographic factors are much involved, yet there is a need for the wide coverage and a proper integrated approach to overcome the social inequalities to improve the health literacy.³

The effects of patient motivation on the brushing of teeth is also significant and low-hanging fruit. It has a positive effect on the improvement of oral hygiene. When the patient is motivated about the tooth brushing and oral cleaning habits, a positive feedback is observed indicating decreased caries ratio and healthy periodontium. The possible interference of the attitude in this aspect cannot be ruled out. Huang et al⁴ reveal that it is necessary for the orthodontist to put emphasis on motivation for maintaining

oral hygiene during the treatment. Various types of oral health promotions and campaigns that are meant for increasing the oral hygiene and its effects are extremely important and add much contribution in minimizing the oral diseases related to the poor oral hygiene. This can improve the elderly oral health and the periodontal status.⁵

The conventional tooth brushing with the periodic use of the interdental brush increases the oral hygiene. Makeeva et al⁶ relates the maximum efficiency of oral hygiene was achieved by both the manual tooth brushing combined with interdental brushing. Generally, it is assumed that the elderly patients have more prevalence of root surface caries. It may be true in some aspect as the exposure of root surfaces are mostly due to gingival recession in old age. There are also some other factors involved in these types of carious lesions. Besides this, the oral hygiene index is also thought to be a vital determinant for the healthy dentition. Usually, this is also observed to be low scored in the elderly patients. Our study was conducted to evaluate how truly these two factors co exist in our community. In addition, dental attrition is also an important factor to be observed in specified three different age categories.

MATERIAL AND METHODS

This study was carried out at Nistar Institute of Dentistry, Multan from 1st January 2018 to 31st March 2018. Total no. of 310 patients were selected and examined randomly at the outdoor department. A proper history was taken from the participants. All the patients were categorized in three groups according to their age described in the table as under. We had three types of categories including root surface caries, oral hygiene index and the dental attrition on which our focus of research was there. The patients were examined in well illuminated light of dental unit with common examination instruments including dental mirror, excavator and the cotton pliers. All the four quadrants were examined thoroughly to find out the caries, oral hygiene index score and the evaluation of dental attrition. Only those carious lesions were taken into account which were just below the cemento-enamel junction or on the root surface of teeth. The tooth surfaces examined were buccal, lingual and the proximal areas. The oral hygiene index was calculated by Debris index and Calculus index. All the patients were then given the final score of the index. Attrition was calculated by simplified scoring criteria for tooth wear index 16. The null hypothesis (H₀) suggests that there is no difference between the age group of the patients and presence of lesions or the oral hygiene status. The alternative hypothesis (H_a) suggests that a relationship exists between the age group and the lesion category. *Chi square* data tool was applied for the results. It includes the sum of all the $(fo-fe)^2/fe$. (*fo*, the frequency of the observed data and *fe*, the frequency of the expected values). Degree of freedom (Df) remains 4 with probability level (α) = 0.05.

RESULTS

According to Chi square table value of α with degree of freedom 4 is 9.488 while our statistics show it to be 3.2675. So we cannot reject the null hypothesis because 3.2675 is lesser than 9.488. The data suggest that there is a no relationship between the variables i.e. age group and the

root surface caries with oral hygiene and dental attrition as assessed (Tables 1-2, Fig. 1).

Table 1: Frequency of age according to category

Category	Age group I	Age group II	Age group III	Total
Root surface caries	20	49	61	130
OHI (≥ 3)	27	62	52	141
Attrition (≥ 1)	08	14	17	39
Total	55	125	130	310

Table 2: Expected (*fe*) contingency table with chi square statistic for each cell

Category	Age group I	Age group II	Age group III
Root surface caries	23.06 [0.41]	52.42 [0.22]	54.52 [0.77]
OHI > 3	25.02 [0.16]	56.85 [0.47]	59.13 [0.86]
Attrition	06.92 [0.17]	15.73 [0.19]	16.35 [0.03]

Chi Square = 3.2675
 Degree of freedom = 4
 The p value is < 0.514102 (NS)

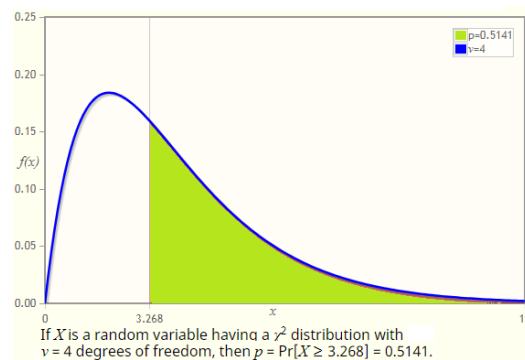


Fig. 1: The Chi square distribution with r = 4 df

DISCUSSION

Root surface caries and dental attrition are common findings in different age groups. These are also related to oral hygiene index. There are multiple etiologic factors that are involved in the root surface caries. The highest percentage of decreased oral hygiene was found to be in the age group II i.e. 49.6%. and the generalized attrition was more common in the age group I i.e. 14%. However, the root surface caries was more pronounced in the age group III i.e. 46.9%. Root surface caries is mostly observed in the elderly patients where the gum recession and poor hygiene cause the decay of the root surface. Periodontitis is also a cause for root surface caries. Root surface caries in China has different risk factors in the middle aged and elderly people. According to Gao et al⁷ periodontitis and unhealthy oral cleaning habits were the causes of the root caries. Our study indicates that the second age group has more compromised oral hygiene status. However, the lack of cleaning and reduced oral hygiene was present in the elderly group as well. When there is increased awareness among the patients about the oral hygiene, it amplifies its benefits. It will lead to reduced caries ratio as well as other associated periodontal pathologies.

The habits of decrease tooth brushing is considered as one of the major factor in the occurrence of root caries. Root caries increases slowly with the passage of time in the healthier Australians. The cause is the irregular tooth brushing, smoking and lack of dental visits.⁸ Majority of the patients in our third age group were non-smokers. Only a few were observed as smokers who had a casual attitude towards the dental checkups. Hellyer⁹ reported that there was 88.4% of root surface caries in patients of 55 years old and above this age. In addition, there are a number of risk factors that are responsible for the root surface caries. These include xerostomia, mental disorders, depression, diabetes and uses of certain medications. It has been observed that when the gum recedes, it exposes the root surface, which is more prone to caries. Not only the dentinal portion is abraded by the tooth brushing but may also lead to pain and hypersensitivity.

According to Carvalho et al¹⁰ gingival recession is the main cause of the root caries and dentinal hypersensitivity. As an age change, the thickness of enamel is reduced due to the wearing phenomena. Another interesting finding in our study was that there had been lack of knowledge among most of the patients regarding the desired tooth brushing technique. It might be a possible explanation for increased score index. It is also particularly important when we expect the positive outcome in terms of oral hygiene measures. Poor oral hygiene is responsible for caries, periodontitis and other associated pathologies. All the teeth with carious lesions can be restored with certain types of restorative materials. This includes conventional restoration with the composite, amalgam and the glass ionomer cement. The currently innovated materials including the bio glass and Calcium Phosphopeptide Amorphous Calcium Phosphate (CPP-ACP) have gained much popularity in arresting these carious lesions. These may be used either alone or in combination with the fluoride applications. The pioneering study of Sleibi et al¹¹ provides in depth analysis of bioglass/fluoride combination that has an increased effect than either CPP-ACP with fluoride or fluoride only to reverse and arrest the root caries in a laboratory.

Moreover, the cleansing capacity of the saliva in the oral cavity remains an important factor that in turns reduces the caries and other oral pathologies. This function of saliva being an influential landmark beautifully explains the reduced caries ratio in certain patients having the certain genetic disorders like Down's syndrome in which there is excessive saliva formation. Some investigators hold the view that the reduced saliva pH and flow rate in the post-menopausal women leads to increased OHI and DMFT.¹²

The low salivary pH, decreased salivary flow and consumption of acidic foods are thought to be the major causes of tooth wear.¹³ Oral hygiene awareness is necessary for the prevention of gum diseases. A good motivation among the patients would lead to the reduced gingival pathologies. It has been clearly observed by some investigators who provided an evidence of reduced gingivitis cases in the school going children.¹⁴ Some investigators have also reported that the conventional methods of tooth brushing cause damage of the gums, leading to bleeding and gingival recession.¹⁵

The overwhelming majority of investigators agree to this point. It is, therefore, highlighted that a good brushing

technique has something to do with good oral health.^{16,17} There are a number of techniques are available for the teeth cleansing. Nevertheless, in our social environment where many people are illiterate, this requires a simplified form of techniques to be implemented. Patients can be motivated in kicking a habit of the undesirable brushing techniques and pointing them the simplest possible ways of the recommended tooth brushing. It all depends upon the patient's compliance regarding the basic understandings and their needs. Therefore, one should always be hopeful that a persistent motivation of oral hygiene maintenance would likely be somewhat fruitful in the near future.

CONCLUSION

Insights gained from this study are that the root surface caries is distributed unequivocally among the three categories of the age groups. In the same way, the oral hygiene index and the dental attrition had the equal prevalence among three age groups. The oral hygiene index of the age group II was more pronounced as compared to other two categories. However, attrition is observed more in the age group III of the patients. Perhaps the most compelling finding is the presence of root surface caries and attrition in the younger patients. As far as the outcomes of third age group are concerned, it is not long in tooth but manageable yielding good results. These findings might help us to find new ways of improving oral health.

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