

A Study on Prevalence of Dental Attrition and its Relation to Factors of Age, Gender and to the Signs of TMJ Dysfunction

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Abstract A study was planned to determine the severity of dental attrition in adults of both sexes in different age groups and its possible relationship to temporomandibular disorders. 500 subjects comprising of 260 females and 240 males in the age group of 18–55 years were clinically examined for bruxism, attrition, and signs of temporomandibular disorders. Tooth sensitivity, tooth or restoration fracture, scalloping of tongue, ridging of buccal mucosa, TMJ sounds, muscle tenderness, TMJ tenderness, referred pain, pain on mouth opening and limitation of mouth opening were recorded along with attrition score in a proforma. The basic data was then analysed to arrive at certain conclusions. A high prevalence of attrition (88.0%) with increase in age ($P < 0.00$) and was seen more in males as compared to females ($P < 0.01$). On comparing attrition with some of the signs of bruxism it was shown that tooth or restoration fracture and scalloping of tongue had no relation to the severity of attrition score. Whereas a significant relation was seen between attrition and tooth sensitivity ($P < 0.00$), and ridging of buccal mucosa ($P < 0.05$). Muscle tenderness ($P < 0.00$), pain on mouth opening ($P < 0.05$) and deviation of mandible on mouth opening ($P < 0.00$) had significant relation to attrition.

Other signs of temporomandibular disorders such as joint tenderness, referred pain, joint sounds and limitation of mouth opening had no relation to attrition score. This study showed a limited association between the severity of attrition and TMJ dysfunction.

Keywords Dental attrition · Bruxism · TMJ dysfunction

Introduction

The masticatory system is an extremely complex mechanism consisting of the jaw bones, muscles, ligaments and teeth. The masticatory movement is regulated by an intricate voluntary and involuntary neurologically controlled mechanism, where each movement is coordinated to have maximum function while minimising damage to any one of the structure of masticatory mechanism. In a remarkable manner in most instances the masticatory system functions without serious dysfunction or disarrangement during ones life-time. When a breakdown occurs in one unit of the system, however, it can produce damaging complications in other components of the system.

Parafunctional habits such as bruxism and clenching largely increase the magnitude of force applied on the masticatory system. As a consequence to this, signs of breakdown of the muscles, the TMJs, the supportive structures of the teeth, and the hard structure of the teeth is noticeable.

Dental attrition is considered as a visible sign of physiological functional wear and a rather rapid onset in bruxism. It is probably seen more as a result of functional disturbance in the masticatory system.

Parafunctional habits of bruxism and clenching are of serious concern to the patient and the dental professionals because of its strong clinical association to the

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temporomandibular joint disorders. There is sufficient evidence to show that the repetitive chronic trauma due to clenching and grinding habits may stimulate altered muscle activity, remodeling of joint which may occasionally initiate a degenerative process. Besides its relationship to TMJ dysfunction, some of the largely reported signs of bruxism are attrition, teeth sensitivity, scalloping of tongue, ridging of buccal mucosa, cracks in teeth and fracture or chipping of teeth and restoration.

Considering the adverse effects of attrition on the masticatory system a study was planned to determine the severity and location of dental attrition in adults of both sexes in different age groups and its possible relation to temporomandibular disorders.

Materials and Methods

The samples of this study consisted of 500 adults of equal sexes in the age group of 18-55 years. Each subject was clinically examined for signs and symptoms of bruxism, attrition and temporomandibular disorders. The subjects were selected at random and had a minimum of five teeth in each quadrant of the arch.

Clinical Examination for Bruxism

Attrition: The degree of attrition was assessed by the following criteria:

| Score | Surface | Criterion |
|-------|---------|--|
| 0 | O/I | No loss of enamel surface characteristics |
| 1 | O/I | Loss of enamel surface characteristics |
| 2 | O | Loss of enamel exposing dentin for less than one-third of the surface |
| | I | Loss of enamel just exposing dentin |
| 3 | O | Loss of enamel exposing dentin for more than one-third of the surface |
| | I | Loss of enamel and substantial loss of dentin, but not exposing pulp or secondary dentin |
| 4 | O | Complete loss of enamel, or pulp exposure, or exposure of secondary dentin |
| | I | Pulp exposure or exposure of secondary dentin. |

O Occlusal, I Incisal

After scoring the individual teeth, the sum score of all teeth examined was divided by the number of teeth. The value obtained was considered as the attrition score. This

attrition index is modified from the tooth wear index [1] given by Smith and Knight in 1984.

The subjects were also examined for teeth sensitivity, tooth or restoration fracture, scalloping of tongue and ridging of buccal mucosa.

Clinical Examination for Temporomandibular Joints

TMJoint Sounds

Joint sounds were observed by hearing as well as auscultation. The sounds were classified as Crepitus and Clicking.

TMJ Tenderness

Palpation of the lateral side of both the joints as well as palpation through external auditory meatus was done to elicit tenderness.

The subjects were also observed for any signs of referred pain during opening or closing of the mouth.

Deviation of Mandible on Mouth Opening

The subjects were asked to gently open the mouth and then examined for any deviation of the mandible while closing.

Limitation During Mouth Opening

Opening is measured from upper incisor tip to lower incisor tip. Lateral and protrusive movements are also observed.

Muscle Tenderness

Muscles of mastication and neck muscles were palpated for tenderness.

Temporalis

The origin is palpated extra-orally between the superior and inferior temporal lines just above the ear. The insertion is palpated extra-orally where the tendon inserts into the coronoid process.

Medial Pterygoid

The medial pterygoids are palpated at their insertions on the medial surface of the mandibular angles.

Lateral Pterygoid

This muscle is best examined by recording its response to resisted movement.

Masseter

The masseter is palpated bimanually by placing one finger intra-orally and other on the cheek.

Posterior Neck Muscles

(i.e. trapezius, splenius capitis and semispinalis capitis)
The right and left occipital areas are palpated

simultaneously at the origin of the muscles. The fingers then move inferiorly down the length of the muscles to the shoulder area.

Sternocleidomastoid

These muscles are palpated bilaterally near their insertions on the outer surface of the mastoid fossae, behind the ears down to the origins near the clavicle.

All the subjects were examined for the presence of bruxism, attrition and any sign of temporomandibular joint dysfunction. The information was recorded in a proforma and further analysed.

Proforma

Name

Age

Address

Sex 1. Male 2. Female

Diet 1. Mixed 2. Veg

A. Clinical Examination for signs of Bruxism

Attrition

| | | | | | | | | | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 17 | 16 | 15 | 14 | 13 | 12 | 11 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 47 | 46 | 45 | 44 | 43 | 42 | 41 | 31 | 32 | 33 | 34 | 35 | 36 | 37 |

| | | | | |
|-------------------------------|------------|--------------------------|-----------|--------------------------|
| Tooth Sensitivity | 1. Present | <input type="checkbox"/> | 2. Absent | <input type="checkbox"/> |
| Tooth or restoration fracture | 1. Present | <input type="checkbox"/> | 2. Absent | <input type="checkbox"/> |
| Scalloping of tongue | 1. Present | <input type="checkbox"/> | 2. Absent | <input type="checkbox"/> |
| Ridging of buccal mucosa | 1. Present | <input type="checkbox"/> | 2. Absent | <input type="checkbox"/> |

B. Examination of Temporomandibular joints

| | | | | |
|--|------------|--------------------------|-----------|--------------------------|
| Joint Sounds | 1. Present | <input type="checkbox"/> | 2. Absent | <input type="checkbox"/> |
| Crepitus | 1. Present | <input type="checkbox"/> | 2. Absent | <input type="checkbox"/> |
| Clicking | 1. Present | <input type="checkbox"/> | 2. Absent | <input type="checkbox"/> |
| Muscle tenderness | 1. Present | <input type="checkbox"/> | 2. Absent | <input type="checkbox"/> |
| Joint tenderness | 1. Present | <input type="checkbox"/> | 2. Absent | <input type="checkbox"/> |
| Referred Pain | 1. Present | <input type="checkbox"/> | 2. Absent | <input type="checkbox"/> |
| Pain on mouth opening | 1. Present | <input type="checkbox"/> | 2. Absent | <input type="checkbox"/> |
| Deviation of mandible on mouth opening | 1. Present | <input type="checkbox"/> | 2. Absent | <input type="checkbox"/> |
| Limitation of mouth opening | 1. Present | <input type="checkbox"/> | 2. Absent | <input type="checkbox"/> |

Results

The basic data is presented in the following tables.

Frequency Distribution of Attrition Score in 500 Subjects

| Attrition score | Frequency | Percent |
|-----------------|-----------|---------|
| <0.5 | 27 | 5.4 |
| 0.5–1.0 | 58 | 11.6 |
| 1.0–1.5 | 144 | 28.8 |
| 1.5–2.0 | 141 | 28.2 |
| 2.0–2.5 | 91 | 18.2 |
| >2.5 | 39 | 7.8 |

60% of the subject showed that attrition score between 1.0 and 2.0 in less than 6% the lowest score of less than 0.5 was seen. The highest score of about 2.5 was seen in 7.8%

Attrition Score in Relation to Various Age Groups

| Attrition score | Age groups | | | |
|-----------------|------------|-------|-------|-----|
| | <25 | 25–35 | 35–45 | >45 |
| <0.5 | 27 | | | |
| 0.5–1.0 | 44 | 8 | 6 | |
| 1.0–1.5 | 42 | 84 | 12 | 6 |
| 1.5–2.0 | 23 | 58 | 44 | 16 |
| 2.0–2.5 | 8 | 20 | 39 | 24 |
| >2.5 | | 14 | 17 | 8 |

$\chi^2 = 254.43666, P = 0.00000$ VHS

The above table shows the severity of attrition in relation to different age groups. In the age group less than 25 years 86 subjects showed attrition score between 0.5 and 1.5. No subject showed attrition score above 2.5 and 8 showed attrition between 2.0 and 2.5.

In the age group of 25–35 years 142 showed attrition score between 1.0 and 2.0. No subject showed attrition score less than 0.5 and 8 showed attrition showed attrition between 0.5 and 1.0.

In the age group of 35–45 years 83 showed attrition score between 1.5 and 2.5. No subject showed attrition score less than 0.5, 6 showed attrition between 0.5 and 1.7 and 17 showed attrition score greater than 2.5.

In the age group of above 45 years 40 showed attrition score between 1.5 and 2.5. No subject showed attrition score less than 1, and 8 showed attrition score greater than 2.5.

Severity of Attrition According to the Sex

| Attrition score | Gender | |
|-----------------|--------|--------|
| | Male | Female |
| <0.5 | 6 | 21 |
| 0.5–1.0 | 32 | 26 |
| 1.0–1.5 | 78 | 66 |
| 1.5–2.0 | 58 | 83 |
| 2.0–2.5 | 35 | 56 |
| >2.5 | 31 | 8 |

$\chi^2 = 32.048, P = 0.00001$ VHS

The lowest attrition score of 0.5 was seen more in females than in males whereas the highest attrition score of greater than 2.5 was seen more in males. There was no appreciable difference in distribution of 0.5–2.5 attrition score range between males and females.

Severity of Attrition in Relation to Tooth Sensitivity

| Attrition score | Tooth sensitivity | |
|-----------------|-------------------|--------|
| | Present | Absent |
| <0.5 | 6 | 21 |
| 0.5–1.0 | 12 | 46 |
| 1.0–1.5 | 38 | 106 |
| 1.5–2.0 | 32 | 109 |
| 2.0–2.5 | 39 | 52 |
| >2.5 | 20 | 19 |

$\chi^2 = 23.40954, P = 0.00028$ HSIG

Tooth sensitivity was seen in 29.4% of subjects. In general there was increase in tooth sensitivity with increase in attrition score. Nearly half the subjects with attrition score above 2.5 showed tooth sensitivity.

Severity of Attrition in Relation to Tooth or Restoration Fracture

| Attrition score | Tooth or restoration fracture | |
|-----------------|-------------------------------|--------|
| | Present | Absent |
| <0.5 | | 27 |
| 0.5–1.0 | 4 | 54 |
| 1.0–1.5 | 8 | 136 |
| 1.5–2.0 | 12 | 129 |
| 2.0–2.5 | 8 | 83 |
| >2.5 | 2 | 37 |

$\chi^2 = 3.71503, P = 0.59113$ NS

The lowest incidence of fracture was seen in subjects with attrition score of 2.5 whereas a higher incidence of tooth or restoration fracture was seen in scores below 2.5. Therefore it is not possible to establish any correlation between degree of attrition and tooth or restoration fracture.

Relation Between Attrition Score and Scalloping of Tongue

| Attrition score | Scalloping of tongue | |
|-----------------|----------------------|--------|
| | Present | Absent |
| <0.5 | 9 | 18 |
| 0.5–1.0 | 14 | 44 |
| 1.0–1.5 | 42 | 102 |
| 1.5–2.0 | 37 | 104 |
| 2.0–2.5 | 30 | 61 |
| >2.5 | 8 | 31 |

$\chi^2 = 3.32175, P = 0.65051$ NS

The highest attrition score showed the lowest incidence of scalloping. Attrition score of both below 0.5 and 2.0–2.5 showed scalloping of tongue in 30% subjects. Attrition score above 2.5 showed scalloping in 20% subjects. This means scalloping is more common when there is minimal attrition, therefore degree of attrition and scalloping cannot be related.

Relation Between Attrition Score and Ridging of Buccal Mucosa

| Attrition score | Ridging of buccal mucosa | |
|-----------------|--------------------------|--------|
| | Present | Absent |
| <0.5 | 23 | 4 |
| 0.5–1.0 | 34 | 24 |
| 1.0–1.5 | 78 | 66 |
| 1.5–2.0 | 75 | 66 |
| 2.0–2.5 | 56 | 35 |
| >2.5 | 27 | 12 |

$\chi^2 = 12.87320, P = 0.02460$ SIG

Ridging of buccal mucosa was the most prevalent sign seen. 58.6% showed ridging of buccal mucosa. The subjects with less than 0.5 attrition score showed the highest incidence of ridging of buccal mucosa while the other scores showed lesser incidence.

Relation Between Attrition Score and Temporomandibular Joint Sounds

| Attrition score | Joint sounds | |
|-----------------|--------------|--------|
| | Present | Absent |
| <0.5 | 12 | 15 |
| 0.5–1.0 | 16 | 42 |
| 1.0–1.5 | 60 | 84 |
| 1.5–2.0 | 38 | 103 |
| 2.0–2.5 | 34 | 57 |
| >2.5 | 12 | 25 |

$\chi^2 = 9.63243, P = 0.08635$ NS

The highest incidence of joint sound was seen in when the attrition score was below 0.5. In the other instance there was more or less uniform distribution of joint sound.

Relation Between Attrition Score and Muscle Tenderness

| Attrition score | Muscle tenderness | |
|-----------------|-------------------|--------|
| | Present | Absent |
| <0.5 | | 27 |
| 0.5–1.0 | 6 | 52 |
| 1.0–1.5 | 16 | 128 |
| 1.5–2.0 | 14 | 127 |
| 2.0–2.5 | 21 | 70 |
| >2.5 | | 39 |

$\chi^2 = 21.15453, P = 0.00076$ VHS

There was no muscle tenderness in the lowest attrition score. There was an increase in the symptom of muscle tenderness with increase in attrition score.

Relation Between Attrition Score and Joint Tenderness

| Attrition score | Joint tenderness | |
|-----------------|------------------|--------|
| | Present | Absent |
| <0.5 | | 27 |
| 0.5–1.0 | 4 | 54 |
| 1.0–1.5 | 6 | 138 |
| 1.5–2.0 | 8 | 133 |
| 2.0–2.5 | 8 | 83 |
| >2.5 | | 39 |

$\chi^2 = 6.71575, P = 0.24265$ NS

No significant correlation was observed between joint tenderness and attrition score. The lowest as well as the highest attrition score did not show any symptom. Between these two scores joint tenderness was uniformly distributed.

Relation Between Attrition Score and Referred Pain

| Attrition score | Referred pain | |
|-----------------|---------------|--------|
| | Present | Absent |
| <0.5 | | 27 |
| 0.5–1.0 | 2 | 56 |
| 1.0–1.5 | 10 | 134 |
| 1.5–2.0 | 8 | 133 |
| 2.0–2.5 | 12 | 79 |
| >2.5 | 2 | 37 |

$\chi^2 = 9.31413, P = 0.09717$ NS

No correlation could be established between attrition score and referred pain.

Relation Between Attrition Score and Pain on Mouth Opening

| Attrition score | Pain on mouth opening | |
|-----------------|-----------------------|--------|
| | Present | Absent |
| <0.5 | | 27 |
| 0.5–1.0 | 4 | 54 |
| 1.0–1.5 | 2 | 142 |
| 1.5–2.0 | 6 | 135 |
| 2.0–2.5 | 8 | 83 |
| >2.5 | | 39 |

$\chi^2 = 12.03791, P = 0.03427$ SIG

A greater number of subjects showed pain on mouth opening in the 2.0–2.5 range of attrition score as compared with lower attrition scores. Again the highest and lowest attrition scores did not show any pain on mouth opening.

Relation Between Attrition Score and Deviation of Mandible on Mouth Opening

| Attrition score | Deviation of mandible on mouth opening | |
|-----------------|--|--------|
| | Present | Absent |
| <0.5 | 6 | 21 |
| 0.5–1.0 | 14 | 44 |
| 1.0–1.5 | 62 | 82 |
| 1.5–2.0 | 30 | 111 |
| 2.0–2.5 | 15 | 76 |
| >2.5 | 13 | 26 |

$\chi^2 = 26.76551, P = 0.00006$ VHS

In comparison to the other signs of temporomandibular joint disorder, deviation of the mandible on mouth opening showed a higher incidence in various attrition score ranges.

Relation Between Attrition Score and Limitation of Mouth Opening

| Attrition score | Limitation of mouth opening | |
|-----------------|-----------------------------|--------|
| | Present | Absent |
| <0.5 | | 27 |
| 0.5–1.0 | 4 | 54 |
| 1.0–1.5 | 8 | 136 |
| 1.5–2.0 | 4 | 137 |
| 2.0–2.5 | 2 | 89 |
| >2.5 | | 39 |

$\chi^2 = 6.61992, P = 0.25048$ NS

Limitation of mouth opening was seen as the least among the temporomandibular joint disorder signs. There was no limitation of mouth opening in the highest and lowest attrition scores. There was no limitation of mouth opening in the highest and lowest attrition scores. No correlation could be established between attrition scores and clinical signs.

Discussion

The temporomandibular joint disorders have been related to various etiological factors, among them bruxism is one which requires serious consideration. There are a few references in the literature to show the correlation between temporomandibular joint disorder and attrition. It is not certain whether attrition is a cause of temporomandibular joint disorder, but it is definitely beneficial to study the prevalence of attrition and its relation to age and gender of an individual and relate it to temporomandibular joint disorders. With this objective in mind this study was conducted among the local population between 18 and 55 years of age to ascertain the interrelationship between these factors. The basic data from 500 samples consisting of 240 males and 260 females were recorded in proforma and the data was statistically analysed. The results showed certain interesting objectives and findings.

It was discouraging to observe that 80% of the samples had one or more tooth with significant attrition with grades of 2 or more on a 0–4 scale of a standard attrition index [1]. This was seen in 400 subjects out of total of 500, which means that 8 out of 10 subjects showed attrition up to the dentin. This is in agreement with the study by Seligman et al. [2] where 91.5% of the young adult population showed a similar wear.

There was an increase in attrition score with the increase in age ($P < 0.00$). This showed that as the age advances, attrition becomes more severe. This finding is in contrast with Seligman et al. [2], Egermark-Ericksson [3], Richmond et al. [4] and Clark et al. [5] who did not find any relation between age and degree of attrition. They suggested that severe attrition is mostly the result of bruxing activity and to a lesser extent as a result of functional wear. These studies were done on young adults where age differences of subjects was not significant as compared to this study.

Results of this study suggested that functional wear was more with increase in age and attrition was not as a result of only bruxism or the other parafunctional activities but also due to functional activities. This observation is relevant to our population. This can be explained by the fact that the type of food is primarily coarse and non-refined and the association of horizontal–lateral grinding of food, which is observed in our population.

In general men showed higher attrition scores than women ($P < 0.01$), at the same time men had fewer temporomandibular joint dysfunction symptoms. This is similar to the findings of Seligman et al. [2] and Solberg [6]. The higher attrition score in men may be probably due to strong masseter function, greater muscle fiber mass and stronger ligaments. These would support the joint better in men and possibly reduce the harmful effects of bruxism so that they have less temporomandibular joint symptoms.

Gray et al. [7] showed that there is strong correlation of bruxism with attrition, tooth sensitivity, tooth or restoration fracture, ridging of buccal mucosa and scalloping of tongue. In this study it was found that there was no correlation of attrition with scalloping of tongue and tooth or restoration fracture. However, there was significant correlation of attrition with ridging of buccal mucosa ($P < 0.05$) and tooth sensitivity ($P < 0.00$).

Therefore by interpreting these results we can infer that if attrition is present with ridging of buccal mucosa and tooth sensitivity it may be indicative of active bruxism. Attrition could have occurred due to other reasons in past, hence attrition alone cannot be considered as a reliable sign of bruxism.

The frequency of TMJ clicking (22.0%) and crepitus (12.5%) confirms the studies of Solberg et al. [8] and Spencer [9] which showed 17% clicking and 12% crepitation. A study done by the Pullinger et al. [10] however, showed 29% clicking and 3% crepitation. However, while combining both these symptoms the total percentage found in this study agreed with the above three studies. There was no correlation between the TMJ sounds and attrition score.

Muscle tenderness was seen in 11.4% of subjects. This does not agree with studies done by Pullinger et al. [10], Solberg et al. [8], Spencer [9], De Laat et al. [11] which showed a frequency between 29 and 34%. In contrast Gross and Gale [12] in their study found only 8.8% of the sample population with muscle tenderness which is in agreement with our result. This study showed a strong association between the presence of muscle tenderness and severity of attrition scores ($P < 0.00$). A similar association was found in the study by Egermark-Eriksson [3] and De Laat et al. [13]. However, Reuling [14] and Seligman et al. [2] found no association between attrition scores and presence of muscle tenderness. The influence of attrition on muscle tenderness observed in this study can be explained by the fact that prolonged muscle hyperactivity can result in muscle tenderness and dental wear can be an indication of parafunctional habits.

Joint tenderness was seen in 5.2% of the sample and this is in agreement with studies done by Pullinger et al. [10], Solberg et al. [8], Spencer [9], Swanljung et al. [15], Hansson et al. [16] and Grossfield et al. [17] which showed joint tenderness from 2 to 10%. In this study no significant relation was found between joint tenderness and attrition. This is in agreement with Pullinger et al. [10], Seligman et al. [2] and Roberts et al. [18] who also found no association between dental attrition and TMJ tenderness.

Referred pain was observed in 6.8%. There was no significant relation between incidence of referred pain and severity of attrition.

Pain on mouth opening was reported in 4.0%. A correlation could be established between pain on mouth opening

with severity of attrition ($P < 0.05$). This can also be explained by taking into consideration the prolonged muscle activity consequent to parafunctional habits which causes tenderness and dental wear.

On mouth opening 28.9% showed a deviation of mandible, which is slightly higher than 22% reported by Pullinger et al. [10]. A strong correlation was found between severity of attrition and deviation of mandible while mouth opening ($P < 0.00$).

Limitation of mouth opening was seen in 3.6%. It was the least frequent sign of the temporomandibular joint dysfunction observed in this study, which is in agreement with Solberg et al. [8] and Pullinger et al. [10] who reported an incidence of 2–4%. The relation of this sign with severity of attrition was not significant.

The highlights of this study are that attrition is highly prevalent and seen more in males and it increases in severity with an increase in age. Attrition is not a reliable sign of temporomandibular joint dysfunction but a limited association was established between attrition and signs of temporomandibular joint dysfunction.

Conclusion

From the result of the foregoing study the following conclusions have been drawn.

1. There was a high prevalence of attrition in the sample (80%) and the attrition score, which was seen more in males, increased with age.
2. No significant relation could be seen between tooth or restoration fracture and scalloping of tongue to attrition.
3. Tooth sensitivity and ridging of buccal mucosa had a significant correlation with attrition.
4. Attrition as a single factor cannot be regarded as a reliable sign of bruxism.
5. A significant correlation was seen between an increase in attrition score and some of the temporomandibular joint dysfunction signs, such as muscle tenderness, pain on mouth opening and deviation of mandible while mouth opening.
6. However TMJ sounds, TMJ tenderness, limitation of mouth opening and referred pain could not be related significantly to an increase in attrition score.
7. In general attrition was present to some extent in patients with temporomandibular joint disorder. However, an association between the severity of attrition and temporomandibular joint disorder symptoms cannot be always established.

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