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The Role of Malocclusion in Individuals with Temporomandibular Joint Disorders

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Abstract: The percentage of patients was determined in normal population and amongst different malocclusion groups. The study was conducted on 68 patients of which 34 had temporomandibular disorders. The percentage of individuals without any problem relating their jaw joints, mostly belong to the Class I / normal malocclusion group while the patients in the temporomandibular disorders group show some inclination to Class II Division 2 and Class III Angle malocclusions.

Key words: Malocclusion, temporomandibular disorders, orthodontists, craniofacial growth

Introduction

Orthodontists have made impressive strides in dealing with craniofacial orthopedics and craniofacial growth. Much less effort has been devoted to the orthopedic aspects of the TMJ. The effect of orthodontics in aggravating or ameliorating TMJ problems is now being addressed from inside and outside the orthodontic community and the directions orthodontists should take remain unclear (Solberg *et al.*, 1986). Temporomandibular disorders continue to be viewed as a multifactorial problem. The etiology of TMD (temporomandibular disorders) is generally classified as :

- Factors that increase the risk of temporomandibular disorders (predisposing factors)
- Factors that cause the onset of temporomandibular disorders (initiating factors)
- Factors that interfere with healing or enhance the progression of TMD (perpetuating factors (Mc Neill *et al.*, 1980 and Mc Neill, 1983)

Malocclusion has been implicated as an etiologic factor (Perry 1969; Roberts, 1974 and Roth, 1973). However the results of clinical studies seeking to verify this relationship have been equivocal (Carlsson *et al.*, 1970). Crossbite, maxillary crowding, anterior openbite and excessive incisor overbite have been mentioned as having the strongest association with symptoms of functional disturbances (Mohlin *et al.*, 1980).

Runge *et al.* (1989), in a study which evaluated 226 patients, concluding that static and functional occlusion and skeletal relationships generally did not appear to be contributing factors to TMJ sounds in patients with malocclusions. However a large interincisal angle and increased overbite may have been among the associated factors.

Solberg *et al.* (1986), stated that longer exposure to malocclusion may be associated with more extensive TMJ changes. Stringert and Worms (1986), on the other hand, conducted a study on 62 subjects with documented structural and functional TMJ changes, and compared them to 102 subjects from a normative sample. They concluded that there were no differences in the proportions or characteristics of subjects in any Angle classification group. The aim of our study is to determine the importance of skeletal and dental malocclusion in the etiology of TMJ disfunctioning.

Materials and Methods

This study was conducted on a total of 68 patients of which 34 patients had TMJ symptoms (pain, clicking, crepitus, locking and muscle tenderness). This group was re compared with 34 patients in the same age group (mean age: 22 years and 4 months) , with intact dentition and no problems relating to their jaw joints. The individuals in both groups had not received any previous orthodontic treatment.

The Angle classification (Angle, 1907) of the patients in each malocclusion group (Angle Class I/ normal, Class II/1, Class II/2,

Class III) was recorded and their percentage within the TMJ and control groups was determined. The percentage of patients in the TMJ group was compared with the corresponding malocclusion in the control group and the differences in percentages were noted.

Results and Discussion

The biggest difference was seen in the Class I malocclusion with 26% more individuals in the control group (Table 1). In other words the subjects with no problems relating to their jaw joints consisted mostly of Class I/normal Angle classifications. The differences between the TMJ and control groups in Angle Class II/1, Class II/2 and Class III are 3,14 and 9 %; respectively.

Table 1: The difference between percentages in Angle malocclusion groups of TMJ patients and controls (Angle, 1907)

Angle Class	TMJ Patients (%)	Control (%)	Difference (%)
I / Normal	44	70	-26
II / 1	14	11	+3
II / 2	24	10	+14
III	18	9	+9

Judging from electromyographic and kinesiological studies, malocclusions (crossbites, Class II/1 and deep bite cases), appear to cause neuromuscular dysfunction and reflex mandibular positioning, and contribute to observable disharmonies in chewing patterns (Ingervall and Thilander, 1976 and Moller, 1981). Because these dysfunctions are sufficient to provide ischemic circulatory effects, malocclusions may be a significant factor, predisposing to TM disorders (Moller, 1981).

While a recent study has not found any evidence that posterior or anterior bilateral crossbite is associated with TMD, unilateral posterior crossbite was found to be more common in TMD patients (Seligman and Pullinger, 1991). There is some clinical evidence that appears to relate maloccluding teeth to TMJ disfunctioning. It should be stressed that the vertical problems related to occlusion, seemingly create dysfunction pattern (Perry, 1969).

In our present study, we note the predominance of disturbance in the patients with Class II/2 malocclusion (+ 14%). Solberg and Seligman (1985) report similar results of Howard from a personal communication.

However, when considered individually or simultaneously, little evidence is available that occlusal and other associated factors (Angle malocclusion, deep overbite, minimal overjet, crossbite etc.) that are traditionally implicated in TMD etiology, merit that association. Extensive overbite has been associated with joint sounds, but most studies do not support this association. Extensive overjet is mentioned with TMD symptoms and osteoarthritis, but other studies fail to provide evidence of overjet-TMD relationship (Solberg *et al.*, 1972). Thus, studies to date suggest that, occlusion is likely to be of secondary importance, aggravating symptoms once TMD has become established for other reasons (Mc Neill, 1990).

Orthodontic treatment and other occlusal therapy, help in the

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improvement of TMJ symptoms in correctly diagnosed patients. On the other hand, the effectiveness of relaxation therapies, particularly of acute myofascial disorders, reaffirms the importance of considering factors other than occlusion in treatment. Occlusion, malocclusion and other orthopedic factors therefore, are only one etiologic factor in a complex problem. Future scientifically controlled longitudinal epidemiological studies are required to validate the relationship between occlusion and TMD.

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