

Relationships between oral parafunctions and functional disturbances in the stomatognathic system among 15- to 18-year-olds

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An interview and a clinical examination of signs and symptoms of functional disturbances and diseases in the stomatognathic system were performed on 309 adolescents 15–18 years old. Relationships and differences between data from this investigation were analyzed. Statistically significant correlations were found between headaches, bruxism, and tenderness to palpation of the attachment of the temporal muscle. There were also correlations between occlusal interferences in the retruded position (RP) and clickings and between mediotrusion interferences and clickings. The occlusal interferences were correlated to tenderness to palpation of the TMJ and TMJ muscles. Young people with distal occlusal relation were more frequently conscious of symptoms from the stomatognathic system than those with neutral or mesial occlusal relation. Deep bite was correlated to clenching and frontal dental wear. □ *Temporomandibular joint syndrome; epidemiology; adolescence*

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Symptoms and signs of functional disorders and diseases in the stomatognathic system have been reported to be common among young children and adolescents (5, 8, 19–21). Symptoms, for example, have been experienced in about 40% of the examined subjects, although mostly of a rather mild character. The most prevalent signs have been tenderness on palpation of temporomandibular joint (TMJ) muscles and temporomandibular joints and deviations in movements of the lower jaw. In an investigation including an interview and clinical examination of the stomatognathic system of 309 15- to 18-year-olds, recurrent headaches and clickings were the most commonly reported symptoms (16% and 17%, respectively). Grinding was in this group reported in 7% and clenching in 13% (19).

In adults the etiology of functional disorders and diseases in the stomatognathic system is generally suggested to be multifactorial (4, 16, 23). Psychological, local, and general somatic factors seem to be of importance. For the evaluation of the sig-

nificance of these factors in the population, epidemiological studies are required.

The aim of this investigation was to correlate the data collected from an interview and clinical examination of the above-mentioned study of the 15- to 18-year-old group to evaluate possible etiological factors of functional disorders and diseases in the stomatognathic system in this age group.

Material and methods

A random sample of 405 young people in the 15- to 18-year-old age group was selected from the school dental clinics in Malmö in 1978. Of these, 309 were examined (Table 1). This group and its socioeconomic structure have previously been described (19), and a detailed account been given of an interview and clinical examination (21). On the whole, the socioeconomic structure of the examined group of teenagers was somewhat below average for the city of Malmö. The adolescents were interviewed for symp-

Table 1. Age and sex distributions in a group of 309 15- to 18-year-olds

Age	Sex		Total
	Boys	Girls	
15	51	41	92
16	37	48	85
17	35	40	75
18	24	33	57
Total	147	162	309

toms and parafunctions in the stomatognathic system. The clinical examination included the TMJ, TMJ muscles, occlusion, and mandibular movement. The chi-square test was used for analysis of correlations and differences between groups for the recorded variables. The following levels of significance were used and are denoted by N.S. (not significant): $p \geq 0.05$; $*0.01 \leq p < 0.05$; $**0.001 \leq p < 0.01$; and $***p < 0.001$.

Results

Correlations between symptoms, signs and occlusal findings

Forty-one per cent reported one or more symptoms, such as headaches, pain in the temple region, pain elsewhere in the face, difficulties and pain when opening the mouth wide, pain during chewing, and clicking from the TMJ. Among those who reported symptoms, mediotrusion interferences ($p < 0.01$), clickings audible by stethoscope and tender muscles were recorded more frequently than among those who did not report symptoms ($p < 0.001$). This was also the case for the frequency of irregular opening movements, which were also significantly correlated to current and previous clickings ($p < 0.001$) and pain on opening the mouth wide ($p < 0.01$). Reported previous clickings were significantly correlated to tenderness in the masseter and the lateral pterygoid muscle and to pain on passive opening ($p < 0.05$). Individuals with distal occlusal relations were more frequently conscious of symptoms from the stomatognathic system ($p < 0.01$).

The relationships between current and previous headaches, temple aches, and parafunctions and tenderness on palpation are presented in Table 2. Correlations were observed between clenching and deep bite ($p < 0.01$) and between lip-cheek-biting and interferences in RP and tenderness on palpation over the masseter muscle ($p < 0.01$).

Individuals who had undergone orthodontic treatment showed no difference in the number of occlusal interferences in the retruded position (RP) compared with those who had not undergone such treatment. The subjects with reported current clickings had interferences in RP more often than those without clickings ($p < 0.05$).

Correlations between signs and occlusal findings

Tenderness on palpation over the TMJ laterally and posteriorly and tenderness on palpation of the temporal, masseter, lateral pterygoid, and posterior digastric muscles were significantly correlated ($p < 0.01$ and $p < 0.001$). Those who reported pain on passive opening also had tenderness to palpation of the masseter muscle, the posterior belly of digastric muscle, and the lateral aspect of the TMJ ($p < 0.001$). In the adolescents deviations on opening the mouth wide and asymmetrical lateral mobility were correlated to deviations in protrusive movements ($p < 0.01$).

Adolescents with deep bite more frequently had frontal dental wear ($p < 0.01$). The adolescents with distal occlusal relation showed asymmetrical lateral mobility and irregular movements when opening the mouth wide more frequently than those with neutral or mesial occlusal relation ($p < 0.01$).

Correlations were found between interferences in RP and deviation on maximal mouth opening ($p < 0.01$), tenderness to palpation of the TMJ laterally ($p < 0.05$), and unilateral interferences in RP and irregular movements and deviations on maximal opening ($p < 0.01$). There was also a statistically significant correlation between dental wear in the lateral sections and mediotrusion interferences. Mediotrusion

Table 2. Correlations investigated between head and temple aches, oral parafunctions, and clinical findings

	Parafunctions and clinical findings			
	Grinding	Clenching	Anterior, temporal muscle	Attachment of the temporal muscle
Head and temple ache				
Current headaches	**	***	***	* (N.S.)
Previous headaches	**	***	**	** (N.S.)
Current pain in the temple region	(N.S.)	*	(N.S.)	* (N.S.)
Previous pain in the temple region	(N.S.)	***	(N.S.)	(N.S.)
			Posterior belly of the digastric muscle	Lateral aspect of the TMJ
				Posterior aspect of the TMJ
				(N.S.) *
				**
				*

interferences were correlated to tenderness to palpation of the TMJ laterally ($p < 0.001$). The masseter muscle and the attachment of the temporal muscle were tender to palpation more often in adolescents with mediotrusion interferences than in young people without ($p < 0.05$). Mediotrusion interferences and pain on passive opening also showed a statistically significant correlation ($p < 0.001$).

Discussion

This study is a continuation of an earlier prevalence study of functional disturbances and diseases in the stomatognathic system of the same age group (19). It was undertaken to estimate the need for treatment and to elucidate the etiology of these disorders among adolescents.

Headaches and pain in the temple region were correlated with tenderness to palpation of the TMJ and TMJ muscles. Similar results have been obtained from 7- to 14-year-olds (20) and from adults (1, 2, 7, 10-14, 17, 24). Bruxism seems to play an important role in the etiology of muscle tenderness and recurrent headaches, since there were several strong correlations between clenching, grinding, muscle tenderness, and headaches. The results of this study indicate that teenagers who have headaches and without any apparent medical cause should be given opportunity to an examination of the stomatognathic system.

The significance of occlusal interferences as a trigger for oral parafunctions and their influence on the muscles and TMJ and on the function of the stomatognathic system in general have been discussed by Carlsson (3). In his review it is stated that there is no absolute relationship between interferences and symptoms and signs. Unilateral and bilateral interferences in RP and mediotrusion interferences among the young people in this study showed statistically significant correlations to symptoms, signs, and oral parafunctions. These findings suggest that occlusal interferences are of importance as etiological factors in functional disturbances

and stress the need for occlusal treatment in young people with occlusal interferences combined with symptoms, signs and/or oral parafunctions.

Temporomandibular joint clickings are believed to be associated with disc displacement (6, 15, 25), often associated with muscular incoordination and sometimes deviations in the form of the joint components (9, 18). That occlusal interferences could be an etiological factor in clickings was indicated in this study by the correlations found between clickings, unilateral interferences in RP, and mediotrusion interferences, respectively. In an experimental study Randow et al. (22) showed that occlusal interferences could cause TMJ clickings. These results indicate that attention should be paid to occlusal interferences as etiological factors in clickings.

The young people with distal occlusal relation reported symptoms and, moreover, demonstrated a higher frequency of irregular mandibular opening movements and asymmetrical lateral mobility than the others. In their investigation of school children, Grosfeld & Czarnecka (8) found a relationship between 'malocclusion and musculo-articular disorders' in the age group 13–15 years. They stated that 'malocclusion' had to exist for some time to have an effect on the stomatognathic system. The results of their study of 7- to 14-year-olds (19) show that the detrimental effect of distal occlusal relation is not found until adolescence. Distal occlusal relation seems to be an etiological factor of importance in the development of symptoms and signs in the stomatognathic system. The stomatognathic system in adolescents with distal occlusal relations should be given a functional examination, since this occlusal relation can be a risk factor for the development of functional disorders and diseases in the stomatognathic system.

It can be concluded that the occlusal factors play an important role in the etiology and development of functional disturbances and diseases, including headaches. Such occlusal factors are interferences in RP, mediotrusion interferences, distal relation, and deep bite.

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