The Epidemiology of Self-reported TMJ Sounds and Pain in Young Adults in Israel

Joseph Katz, DMD; Marc Heft, DMD, PhD

Abstract

Objectives: *We investigated the prevalence of self-reported temporomandibular joint sounds (TMJS), masticatory muscle pain (MMP), and their interrelation in a young adult population.* ***Methods:*** *A large sample (n=20,869) of young soldiers aged 18–21 years who attended dental clinics were asked about their experience of TMJ sounds and pain.* ***Results:*** *The overall prevalence of TMJS was 8.4 percent (8.9% in females and 8.2% in males) and for masticatory pain was 4.0 percent for both males and females (P<.001 under chi-square test). Twenty-five percent of patients reporting positive TMJS also reported positive MMP compared to 2 percent in the negative TMJS group (P<.001). Fifty-three percent of patients reporting positive MMP also reported positive TMJS, compared to 6.5 percent in the negative MMP group (P<.001).* ***Conclusions:*** *The low prevalence of TMJ sounds and pain found in these study might be attributed to the different cultural and social environment, as well as to the uniformity in age of the study group. [J Public Health Dent 2002;62(3):177-79]*

Key Words: temporomandibular joint disorders/epidemiology, masticatory muscles, facial pain, military personnel.

Temporomandibular joint sounds (TMJS) frequently are observed in studies of population-based and clinical samples, and symptomatic and asymptomatic individuals (1). Epidemiologic studies of self-reported joint noises range from a prevalence of 9 percent to 26 percent (2); for clinical examination, the prevalence ranges from 8 percent to 36 percent (3). The prevalence of TMJS increases during childhood and is significantly more common in females than in males (4). The significance of most TMJS is unclear and lacks specificity. TMJS can represent normal variation, a sign of previous (resolved) disease, or a sign of active disease. Similarly, self-reported masticatory muscle pain (MMP) lacks specificity. Reported muscle pain can be linked to temporomandibular joint disorders, as well as to other conditions such as headache or neck pain. The pain may also vary in temporal presentation, sporadic or persistent, suggesting different underlying etiopathogenesis.

To ascertain the prevalence of these signs and symptoms and their possible relationship, it is useful to assess their occurrence in large samples of community-dwelling individuals who are not seeking care for those findings. The purpose of the present study was to assess the self-reported prevalence of TMJS and MMP in a large group of military personnel with narrow age range who are a representative sample of their age group, and to investigate a possible relationship between these two self-reported conditions.

Methods

The 20,689 young, healthy subjects who participated in the study were individuals seeking routine dental care at 22 dental clinics spread throughout Israel. Because military service is compulsory in Israel and most military personnel visit one of these clinics, this sample is reasonably representative of the young adult population in Israel.

There were 14,991 men and 5,698 women. The age range was 18–21 years, with mean of 19.8±1 years. Each participant completed a health questionnaire that included the following questions, each of which was answered with a yes or no response:

1. Have you heard sounds from your TMJ in the last six months? (drawing the location of the joint on the lateral aspect of the face)
2. Have you experienced pain in the muscle of mastication during the last six months? (drawing the location of the major masticatory muscles)

The data from the health questionnaire were then collected and entered into a computer database; the chi-square test was used to assess sex differences in TMJS and MMP and the relationship between these conditions.

Results

The prevalence of self-reported TMJS and MMP and the relationship between them in the entire population are presented in Table 1. The prevalence of self-reported TMJS was 8.4 percent (8.9% for women and 8.2% for men). The self-reported prevalence of MMP was 4.0 percent for men and women. The prevalence of MMP in TMJS-positive subjects and TMJS-negative subjects was 25.2 percent and 2.0 percent, respectively ($P<.001$) (Table 2). Sex differences were not found. TMJS was more prevalent among MMP-positive subjects (53%) than among MMP-negative subjects (6.5%) ($P<.001$) (Table 3). The prevalence of these self-reported conditions did not differ significantly between males and females.

Discussion

In the present study of 20,689 young soldiers, a history of TMJS was reported by 1,736 subjects (8.4%). This prevalence was lower than that found

Send correspondence to Dr. Katz, Department of Oral and Maxillofacial Surgery and Diagnostic Sciences, University of Florida, College of Dentistry, PO Box 100416, Gainesville, FL 32610-0416. E-mail: jkatz@dental.ufl.edu. Dr. Katz was formerly with the Department of Oral Medicine, Hadassah School of Dental Medicine, Jerusalem, Israel. Dr. Heft is also with the Department of Oral and Maxillofacial Surgery and Diagnostic Sciences, College of Dentistry, University of Florida. Manuscript received: 12/21/01; returned to authors for revision: 3/26/02; final version accepted for publication: 4/12/02.

previously in studies of both clinical and population-based samples that ranged from 9 percent to 26 percent (1), and might be attributed partially to the military environment, which discourages any sort of physical complaint (5). Cross-cultural studies might also account for this wide range of occurrence; various ethnic groups may respond differently to painful stimulus (6), which might also explain the low prevalence of MMP in this group (4%). TMJS was significantly more prevalent among subjects who reported MMP than among these who did not report MMP (25.2% vs 2.0%), with no significant differences between the sexes. This may reflect a possible difficulty in differentiating the two symptoms, or it may indicate a true relationship between TMJS and muscle pain. The fact that no sex differences were noticed was intriguing in view of the previously reported sex differences on perceived pain (7).

A higher percentage of MMP-positive subjects compared to MMP-negative subjects were positive for TMJS (53% vs 6.5%). This might reflect clicking-associated pain or again a more pronounced somatization process in these subjects.

Some studies showed that subjects with TMJS do not necessarily present with MMP, and not all persons with MMP have TMJS. Brook et al. (8) showed that 70 percent of the subjects who have TMJS eventually will have MMP, while Green and Laskin (1) showed that TMJS is a benign condition that usually does not progress to more serious clinical dysfunction. It is obvious that only longitudinal studies can shed light on this issue.

In some studies, the prevalence of TMJ sounds as found by auscultation was confirmed by self-report (16.7% in children 5 years old) (4), and other studies found a high correspondence between patients' reports of joint or muscle pain and classification into arthrogenous and myogenous pain groups (9). TMJ patients also have reported more numerous and frequent somatic, psychological, and behavioral symptoms of stress compared with their healthy counterparts (10). In a study of adult Dutch population, 21.5 percent perceived some dysfunction and 44.4 percent showed clinically assessed signs; the odds ratio that subjects who perceived signs would present with clinically assessed signs was 2.3 (11). The differences among the various reports might be related to demographic, social, dental, and methodologic factors.

In an extensive study in the United States of an age-stratified sample using a questionnaire screening survey, 12 percent were identified as those who reported "facial ache or pain of the jaw muscles, the joints in front of the ear, or inside the ear, in the previous six months" (12). Using data from a national survey of the US population, Lipton et al. estimated that 6 percent of the population experienced

TABLE 1
Prevalence of MMP and TMJS in Study Population

Population Sample	Total No.	MMP Positive		TMJS Positive	
		No.	%	No.	%
Women	5,698	228	4.0	507	8.9
Men	14,991	596	4.0	1,229	8.2
Total	20,689	824	4.0	1,736	8.4

Differences between men and women were not statistically different.

TABLE 2
Prevalence of MMP by TMJS Status and Sex

Population Sample	Prevalence of MMP in TMJS-positive Subjects			Prevalence of MMP in TMJS-negative Subjects			*P*-value
	Total No.	No.	%	Total No.	No.	%	
Women	507	125	24.6	5,191	115	2.2	<.001
Men	1,229	313	25.5	13,762	271	1.9	<.001
Total	1,736	438	25.2	18,953	386	2.0	<.001

TABLE 3
Prevalence of TMJS in MMP-positive vs MMP-negative Subjects

Population Sample	Prevalence of TMJS in MMP-positive Subjects			Prevalence of TMJS in MMP-negative Subjects			*P*-value
	Total No.	No.	%	Total No.	No.	%	
Women	228	125	54.8	5,470	383	7.0	<.001
Men	596	313	52.5	14,395	915	6.4	<.001
Total	824	438	53.2	19,865	1,298	6.5	<.001

a symptom pattern involving pain in the joint or the face (13), a finding that is in accordance with our findings.

In summary, in a cross-sectional study of a very large population with a narrow spectrum of age, we have determined the self-reported rate of TMJS and MMP. The clear statistical correlation between these symptoms may reflect a social or psychological aspect of some subjects with increased somatization rate, or some causal relationship between these conditions.

References

1. Greene CS, Laskin DM. Long-term status of TMJ clicking in patients with myofacial pain and dysfunction. J Am Dent Assoc 1988;117:461-5.
2. Wanman A, Agerberg G. Tempomandibular joint sounds in adolescents: a longitudinal study. Oral Surg Oral Med Oral Pathol 1990;69:2-9.
3. Könönen M, Waltimo A, Nystrom M. Does clicking in the adolescent lead to painful tempomandibular joint locking? Lancet 1996;347:1080-1.
4. Wildman SE, Christiansen RL, Gunn SM. Crepitation and clicking as signs of TMD in preschool children. Cranio 1999;17:58-63.
5. Janal MN. Pain sensitivity, exercise and stoicism. J R Soc Med 1996;89:376-81.
6. Lawlis GF, Achterberg J, Kenner L, Kopetz K. Ethnic and sex differences in responses to clinical and induced pain in chronic spinal pain patients. Spine 1984; 9:751-4.
7. Ruda MA. Gender and pain. Pain 1993; 53:1-2
8. Brook RI, Leeds LDS. Long-term prognosis for the clicking jaw. Oral Surg Oral Med Oral Pathol 1988;65:668-70.
9. Hesse JR, van Loon LA, Naeije M. Subjective pain report and the outcome of several orthopedic tests in craniomandibular disorder patients with recent pain complaints. J Oral Rehabil 1997;24:483-9.
10. Beaton RD, Egan KJ, Nakagawa-Kogan H, Morrison KN. Self-reported symptoms of stress with temporomandibular disorders: comparisons to healthy men and women. J Prosthet Dent 1991;65:289-93.
11. De Kanter RJ, Truin GJ, Burgersdijk RC, et al. Prevalence in the Dutch adult population and a meta-analysis of signs and symptoms of temporomandibular disorder. J Dent Res 1993;72:1509-18.
12. Dworkin SF, Huggins KH, LeResche L, et al. Epidemiology of signs and symptoms in temporomandibular disorder: clinical signs in cases and controls. J Am Dent Assoc 1990;120:273-81.
13. Lipton JA, Ship JA, Larach-Robinson D. Estimated prevalence and distribution of reported pain in the USA. J Am Dent Assoc 1993;124:115-21.