Prevalence of signs of temporomandibular disorders among elderly inhabitants of Helsinki, Finland

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The prevalence of clinical signs of temporomandibular disorders in 76-, 81-, and 86-year-old subjects living in Helsinki, Finland, were studied, using Helkimo's clinical dysfunction index. In percentage distribution, clinically symptom-free subjects (Di 0) constituted 20% of all those examined, and by percentage the largest group of subjects without signs was that of the oldest men (47%). Women had a higher prevalence of signs of temporomandibular disorders, and only 15% were clinically symptom-free. Four per cent of all those examined had severe symptoms. The commonest signs were impaired range of movement of the mandible and impaired function of the temporomandibular joint. □ *Aged; epidemiology, oral; temporomandibular joint syndrome*

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Although many definitions of temporomandibular disorders (TMD) appear in the literature, the term apparently includes many disorders of the masticatory musculature: myositis, muscle spasm, muscle contracture and myofascial pain syndrome, and temporomandibular joint (TMJ) syndrome, including TMJ capsulitis, TMJ internal derangement with or without reduction, and degenerative joint disease (1). Several epidemiologic studies of different age groups have suggested that signs and symptoms of TMD are common in unselected populations, occurring with equal frequency among males and females (2, 3). Individuals seeking professional help are predominantly women between 20 and 40 years of age (3). Despite these studies it is often difficult to interpret the results, because accepted definitions, selection criteria, and standardization of examination methods are lacking (4, 5).

To clarify the epidemiologic picture of TMD, it is important to investigate the prevalence of TMD in all age groups, including the elderly. Several studies have indicated an increasing risk of TMD with advancing age (6–9), whereas other studies have reported lower frequencies with increasing age (10). Still others have suggested that differences are not age-related at all (4, 11). The aim of the present epidemiologic investigation was to assess the prevalence of clinical signs and intensity of TMD in a group of 76-, 81-, and 86-year-olds living in Helsinki, Finland. Anamnestic symptoms of TMD in this same population have been reported earlier (12).

Materials and methods

The study design and age cohorts were presented in our earlier report (12).

This investigation forms part of a large medical survey of a random sample of subjects born in 1904, 1909, and 1914 (total, 8035) and living in Helsinki in 1989 (13). From each age group 300 subjects were invited to participate. Between 1989 and 1990, 651 subjects participated in the medical examination. In 1990 the 600 subjects who were still alive were invited to the Institute of Dentistry for a comprehensive dental examination. A total of 364 subjects formed the dental study group (61%), of whom 28% were men and 72% women; these were examined in 1990–91 at the Institute of Dentistry, undergoing clinical investigation comprising a complete examination of dental status, salivary secretion, oral mucosa, prostheses, and temporomandibular disorders (14–16). The distribution of the subjects by sex and age in respective groups is given in Table 1.

The investigation of clinical symptoms of TMD was successfully completed among 342 subjects (of whom 29% were men and 71% women) and was carried out by four teachers (A. Ainamo, J. Nevalainen, T. Närhi, K. Schmidt-Kaunisaho) at the Department of Prosthetic Dentistry. The examiners were calibrated, to achieve agreement on the methods used and diagnostic criteria. During the study at least two examiners had the opportunity to discuss uncertainties and reach a final diagnosis. To measure the severity of clinical signs

Table 1. Age and sex distribution in the basic group and the medical and dental study groups

	Basic group 1989							
	75 years		80 years		85 years		Total	
	n	%	*n*	%	*n*	%	*n*	%
Men	1066	30.3	761	25.7	336	21.5	2163	26.9
Women	2450	69.7	2199	74.3	1223	78.5	5872	73.1
Total	3516	100.0	2960	100.0	1559	100.0	8035	100.0
	Medical study group, 1989–90							
	75 years		80 years		85 years		Total	
Men	73	30.5	59	27.6	43	21.7	175	26.9
Women	166	69.5	155	72.4	155	78.3	476	73.1
Total	239	100.0	214	100.0	198	100.0	651	100.0
	Dental study group, 1990–91							
	76 years		81 years		86 years		Total	
Men	48	29.1	34	32.7	20	21.5	102	28.0
Women	117	70.9	72	67.3	73	78.5	262	72.0
Total	165	100.0	106	100.0	93	100.0	364	100.0

of TMD, Helkimo's clinical dysfunction index (Di) was used (17). The dysfunction index is 4-graded: Di 0 is clinically symptom-free; Di I, mild dysfunction; Di II, moderate dysfunction; and Di III, severe dysfunction. The clinical dysfunction index is based on the evaluation of five different signs: impaired range of movement, impaired function of the TMJ, muscle pain, TMJ pain, and pain on movement of the mandible. The only modification of the Di was in the examination of muscle pain. The palpated muscles were the masseter muscle, temporal muscle, lateral pterygoid muscle, medial pterygoid muscle, and digastricus muscle.

For statistical analysis of the data the chi-square test was used to test group differences in signs and symptoms of TMD.

Results

According to Helkimo's clinical dysfunction index (Di) (17), 20% of all subjects examined had no signs (Di 0); 57% had mild signs (Di I); 19% moderate signs (Di II); and 4% severe signs (Di III) (Table 2). The most frequent signs were impaired range of movement and impaired TMJ function (Fig. 1).

Women had a significantly higher prevalence ($p = 0.0001$) of clinical signs than men, and only 15% had no signs (Di 0). Of the men, 32% had no signs (Table 2). Men in the oldest age group had a lower prevalence of signs of TMD ($p = 0.01$) than those in the youngest group, whereas the largest group of subjects with no signs were 86-year-old men (47%). Women showed no differences in the number of subjects with no signs among the three age groups (Table 2). Few subjects had TMJ pain or pain on movement of the mandible in the oldest age groups. When the muscles (m. temporalis, m. masseter, m. pterygoideus lateralis, m. pterygoideus medialis, and m. digastricus) were palpated, 22% of 86-year-old women reacted with pain in three or more palpation sites, whereas none of the men had such a pain reaction.

No differences existed in distribution of the dysfunction index among 76-, 81-, and 86-year-old subjects (Table 2).

Discussion

The ultimate aim of epidemiologic studies is to provide a scientific basis for efforts to prevent and control diseases, illnesses, and disabilities (18). The clinical dysfunction index was chosen because it is one of the most frequently used instruments to measure dysfunction and because this system is acceptable for registration by different examiners (19, 20). This study involved four examiners, although it is recommended that one and the same observer perform the clinical assessment of these variables, except for maximal mouth-opening capacity (21). Although the Helkimo indices have been criticized for being neither optimal nor valid (22), these indices are

Table 2. Percentage distribution of clinical dysfunction index (Di) in 76-, 81-, and 86-year-old subjects ($n = 342$)

Age, years	Di 0			Di I			Di II			Di III		
	M	W	M + W	M	W	M + W	M	W	M + W	M	W	M + W
76	21	15	17	65	56	58	12	25	22	2	4	3
81	39	16	23	55	61	59	3	20	15	3	3	3
86	47	14	22	53	53	53	0	27	20	0	6	5
All	32	15	20	59	57	57	7	24	19	2	4	4

M = men; W = women.

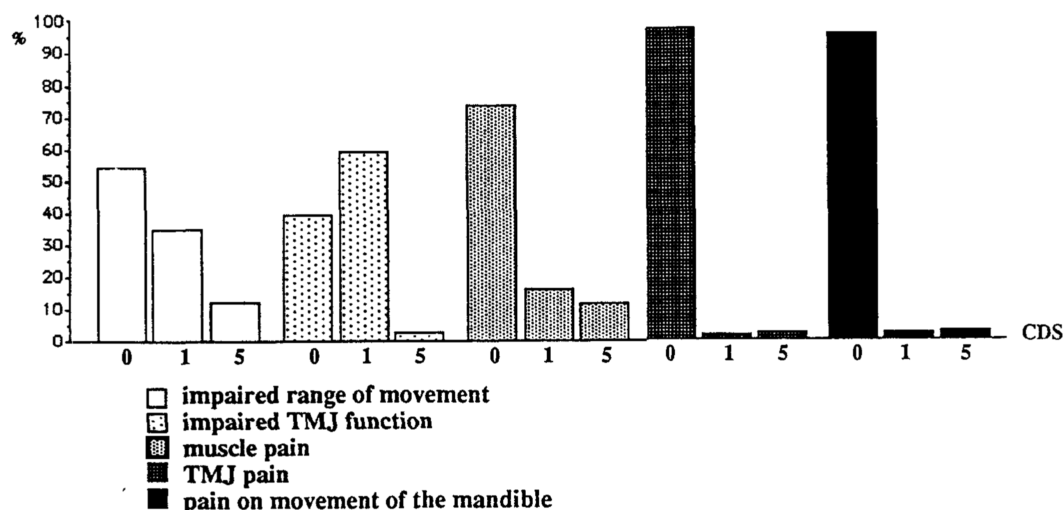

Fig. 1. Frequency distribution of signs by clinical dysfunction score (CDS), with each sign of Di judged on a three-grade scale of severity: 0 = sign absent; 1 = mild signs; 5 = severe signs.

still considered a useful tool in epidemiology (22, 23). There have, however, been efforts to construct new indices (24).

Although Helkimo classified 22% of his sample as Di III (3), others using this index have presented much lower figures for severe signs (2–5%) (10, 25). In the present study 4% of the subjects had severe signs of dysfunction (Di III), and 20% had no signs (Di 0). The 86-year-old men constituted the relatively largest group with no signs (Di 0). However, the groups of the oldest men was numerically the smallest and contained just 20 subjects (Table 1). Salonen et al. reported in their cross-sectional study (7) that the number of subjects free of signs was significantly lower among the women than among the men and was higher in the oldest age group. Österberg et al. (10) concluded in their cross-sectional and longitudinal study that increasing age brings no increased risk of developing more signs and symptoms of craniomandibular disorders. The present cross-sectional study arrived at similar conclusions.

In the present study 46% of the whole population was edentulous, and 44% had complete dentures at least in one jaw. The problems of that kind of 'very old' population are often the same as those of the completely edentulous denture-wearing subjects. Faulkner & Mercado (26) observed more signs of TMD in subjects who had had few sets of complete dentures than in those with several sets of dentures.

It would be interesting to know at what critical point the condition of craniomandibular dysfunction becomes clinically diagnosable (27), especially when the age of the population is taken into consideration. In the light of the present study the signs of TMD seem to decrease with increasing age; one of our future projects is therefore to examine whether there is some kind of alteration in somatic reaction to pain in very old people. The organically impaired elderly may also have difficulties with the perception and expression of pain. Although we may consider some TMD as a generally benign condition (28), it is our duty to discover the possible reason for pain or discomfort and help older patients as best we can when they wish to maintain their ability to cope. The final decision on treatment need should be carefully considered, based on elderly patients' wishes.

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