

Prevalence of Signs and Symptoms of Temporomandibular disorders with aging

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Previous studies of the relationship of TMJ signs and symptoms in elderly people have provided inconsistent findings. The objective of this study was to retrospectively analyze the prevalence of signs and symptoms of temporomandibular disorders(TMD). Additionally, young subjects were examined as a control group. Forty old patients (28 female, 12 male, mean age: 65.2±2.5 years) and forty young patients (30 female, 10 male, mean age: 23.3±2.6 years) clinically diagnosed with TMD were screened. Patient records were analyzed regarding: pain on chief complain, amount of range of mouth opening, TMJ noises(clicking sounds, crepitus), pain on palpation of the TMJ and masticatory muscles and neck and upper back muscles. Differences between the groups were assessed using t-test and the chi-squared test. (SPSS v.17) P value <0.05 was considered statistically significant. Geriatric subjects more often exhibited crepitus on mouth opening (25%), muscular palpation pain of masseter muscles (82.5%) and temporal muscles(60%). In contrast, young subjects more frequently exhibited joint sounds (62.5%), more amount of range of passive mouth opening (p=0.043). It was found that the younger subjects (82.5%) and the older subjects (87.5%) suffered from subjective sign (orofacial pain on chief complain). There were not statistically significant relationships between orofacial pain (VAS) and the groups. Differences between the groups with respect to joint sounds, muscular palpation pain and mandibular range of motion were significant. Although older subjects more frequently exhibited objective signs (crepitus on opening, pain on muscular palpation) of TMD, younger subjects more frequently objective signs (clicking sound on mouth opening, amount of mandibular range of motion).

Key words: Age, Prevalence, TMD

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I. INTRODUCTION

The diagnosis of temporomandibular disorders (TMD) is an umbrella term embracing a number of clinical problems that involve the temporomandibular joint pain and the masticatory muscle troubles.¹⁾ Most patients with TMD suffer from muscle and/or joint pain on palpation and mandibular movements, joint sounds and limit of mandibular range of motion.

Previous studies on the prevalence of signs of TMD in the elder have used non-standardized and invalidated examination protocols. So, there is some confusion regarding the prevalence of TMD signs and symptoms among the elderly. Therefore, the results for older subjects have been inconsistent. The prevalence of signs and symptoms of TMD is low in children and increases during adolescence and young adulthood and seems to be highest among middle-aged subjects.^{2,3)} Some studies have reported that the frequency of symptoms of TMD was similar for various age groups.⁴⁾ Others have found that it was lower among older subjects.⁵⁾ Some described a discrepancy between reported symptoms(subjective) and clinical signs(objective).⁶⁾ here are limits to knowledge of the effects of age on the TMD.

RDC/TMD including standardized clinical examination was used in this study to evaluate the prevalence of subjective and objective signs and symptoms of TMD in randomized geriatric sample and a young adult control group.

II. MATERIALS AND METHODS

1. Subjects

Subjects are group of 40 older subjects(28 female, 12 male, mean age: 65.2±2.5 years) and a control group of 40 younger subjects(30 female, 10 male, mean age: 23.3±2.6 years), seeking treatment for TMD in Department of Oral medicine, Kyung Hee University Dental Hospital during the period from August to November 2011. All subjects were examined by a dentist, according to RDC/TMD. The examination includes the subjective assessment of orofacial pain(VAS) on chief complain, the objective assessment of the presence of joint sounds, pain on the palpation of extraoral masticatory muscles and the range of mandibular motion.

2. Statistics

The Chi-square Test was used for comparison of the categorical variables between the two groups. Two Independent Samples t-test was used for comparison of the continuous variables between the two groups. P value < 0.05 was considered statistically significant. Analyses were performed using commercial software. (PASW v. 17, SPSS Inc, Chicago, IL)

III. RESULTS

1. Pain on chief complain

We use VAS (visual analogue scale) of orofacial pain on chief complain. When they visited dentist for TMD problems, the results show that there were not significant differences on subjective symptoms (pain-VAS). (Table 1)

2. Joint sounds and Joint pain

The results demonstrated that younger subjects frequently exhibited joint sounds while geriatric subjects more exhibited crepitus. Joint pain on movements was not significant differences between younger subjects and older subjects. (Table 2)

3. Metric measurement

Both active pain free opening and passive opening were measured. The values for passive opening were higher in the younger subjects and the differences were significant (t-test). (Table 3)

4. Pain during muscular palpation

Pain during muscular palpation was more frequently found in older subjects on masseter muscle and temporal muscle. (Table 4)

IV. DISCUSSION

This study has demonstrated that older subjects frequently exhibit more crepitus, muscular pain on

palpation. In contrast, the younger exhibit more joint sound (clicking sound) and the more amount of range of passive mouth opening. It should be emphasized in this context that the RDC/TMD

Table 1. Pain on chief complain

	Younger subject (average)	Older subject (average)
VAS	47.9±22.5	53.45±24.6

Table 2. Joint sounds and joint pain

	Younger subject(%)	Older subject(%)	P-value
Joint pain	82.5	87.5	0.775
Joint sound	62.5	37.5	0.044 *
Crepitus	5	25	0.025 *

* $p < 0.05$

Table 3. Metric measurement

	Younger subject(%)	Older subject(%)	P-value
Active pain free opening	41.8±12.0	38.9±7.9	0.221
Passive opening	47.7±10.7	43.5±7.3	0.043 *
Laterotrusion, right	8.0±3.8	8.0±3.0	0.974
Laterotrusion, left	8.0±3.0	8.5±4.5	0.553
Protrusion	5.7±3.0	5.6±2.2	0.772

* $p < 0.05$

Table 4. Pain during muscular palpation

	Youngersubject(%)	Older subject(%)	P-value
Masster muscle	52.5	82.5	0.008 *
Temporal muscle	30	60	0.013 *
Sternocleidomastoid muscle	47.5	52.5	0.823
Trapezius muscle	27.5	72.5	1.000

* $p < 0.05$

evaluates only constant joint sound.

Some study reported that discrepancies between the prevalence of objective and subjective signs and symptoms of TMD could be found in older individual.⁷⁾ In the present study, joint sounds (including crepitus) was found more frequently in the geriatric group. We need to understand physiologic aging process in oromandibular system. A significantly lower density of fibroblasts were observed in the retrodiscal tissues of the elderly. In addition, elderly persons demonstrated a significantly lower distribution of vascular tissue and a significantly higher presence of dense connective tissue in the central third of the posterior disc attachment.⁸⁾ With advances aging, the articular surfaces of the mandibular condyle morphologically showed severe degenerative changes. The condyles with these changes tended to from the side of the mandible with minimal areas of occlusal contact. Radiographically, an irregularity of the cortical bone plate was most commonly seen in the fifth and sixth decades, whereas a polygonal or flattened structure was mainly observed after the seventh decade.⁹⁾ Also, Some study reported that crepitus was frequent in the oldest age group. These authors analysed TMJ autopsy material and concluded that arthrosis is more frequent in older than in younger subjects. As arthrosis manifests crepitus.¹⁰⁾ However, other authors suggest that radiographic appearance of TMJ varied widely, remodeling changes were commonly seen, and there was no direct linear relationship between age and radiographic changes in condylar morphology. So there is no statistically significant association between radiographic changes in condylar morphology and clinical signs and symptoms.¹¹⁾ Turp et al.¹²⁾ found in their study that orthopaedic specialists attached no importance to isolated joint sounds(without pain etc.). M. Schmitter et al.¹³⁾ suggested that although older subjects more frequently exhibited joint sounds(crepitus) of TMD, but they rarely suffered from pain.

The mandibular range of motion was significantly larger in the younger subjects than in the geriatric

sample. Other study concluded that somewhat restricted mandibular opening should be regarded as reflecting an age-related change in the elderly person.^{14,15)}

There are statistically significant relationship between the number of tender masseter muscle and temporal muscle and the older subjects. Some study reported that the analysis of the masticatory function, the values of the electromyographic activity relative to the maximum voluntary contraction were higher for the young subjects than for the elderly subjects. The elderly show hyperactivity of masticatory musculature during posture maintenance and a slight hypoactivity of this musculature during chewing when analysed with young individuals.¹⁶⁾ This fact could be explained by the deterioration of the neuromuscular and sensory control mechanisms, in which there is loss of cells, specifically Betz cell, in the motor cortex¹⁷⁾, inhibiting extensor muscles and reducing the muscular tonus¹⁸⁾, which causes a higher amplitude of movement in elderly individuals. As the hardness of the food increased, the muscular strength necessary for chewing, was higher for elderly individuals. Peyron et al.¹⁹⁾ found a progressive muscular loss as age advances, ranging around 40% when individuals were 75 years old, and, also a decrease in masticatory performance.

Subjects of this study show female patients group is bigger than male patients.

Several studies have found that women have more TMD problems than men.^{20,21)} Females are more vulnerable to subjective and objective signs than males. It is well known that the prevalence of chronic musculoskeletal pain is higher in women than in men,²³⁾ demonstrate lower pain thresholds.²⁴⁾ The mechanisms of the enhanced sensitivity to mechanical stimuli in women are not yet fully understood. The concept of gender roles assumes that a female or male identity is mainly determined by cultural and social norms or differential reinforcement of behaviour. Thus, the behaviour of expressing one's pain could be shaped by social norms and reinforcement. A plausible assumption is

that females willingly reveal their pain and receive positive social feedback, whereas males are not encouraged or even punished for expressing their pain.²⁵⁾ Female gender is a risk factor for TMD.²⁶⁾

Therefore, the older subject more frequently objective signs (crepitus, muscular pain, limit of range of mouth motion) and it may be related aging change in temporomandibular joint and muscular physiology.

V. CONCLUSIONS

The older subjects more frequently exhibited objective signs (crepitus on opening, pain on muscular palpation) of TMD, younger subjects more frequently objective signs (clicking sound on mouth opening, amount of mandibular range of motion).

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국문초록

연령에 따른 턱관절장애의 증상과 징후의 유병률

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노인층에서의 턱관절장애의 증상과 징후에 관한 이전 연구에서 일관된 결론을 제시하지 못하고 있다. 본 연구의 목적은 연령에 따른 턱관절의 증상과 징후의 유병률을 분석하는 것이다. 젊은층을 대조군으로 평가하였다. 40명의 노인층 환자 (28명 여자, 12명 남자, 평균연령: 65.2±2.5)와 40명의 젊은층 환자 (30명 여자, 10명 남자, 평균연령: 23.3±2.6)로서 턱관절장애 (temporomandibular disorders, TMD)로 진단받은 질환자를 대상으로 하였다.

실험 대상자는 다음과 같은 평가기준을 적용하였다. 주관적 평가인 주소에서 구강안면 통증의 정도(VAS), 객관적인 평가에서 하악 개구 시 운동량, TMJ 관절잡음 (관절음, 엽발음), TMJ 촉진 시 통증, 저작과 관련된 근육(교근, 측두근)과 목 근육, 견부근의 촉진 시 통증에 관한 것을 포함한다. 두 그룹 간 차이점 분석은 t 검정과 카이제곱 검정 방법을 사용하였다. (SPSS v. 17) P 값이 0.05 이하인 것을 통계적으로 유의성 있게 보았다.

주관적인 평가에서 주소에 나타난 구강안면 통증 정도에서는 두 그룹 간 유의한 차이는 발견되지 않았다. 객관적인 평가에서 노인층 환자에서 개구 시 엽발음이 25%에서 관찰되었고 저작근 촉진 시 통증은 82.5%에서 관찰되었으며 측두근 촉진 시에 60%에서 통증을 보였다. 반대로, 젊은층에서 62.5%에서 관절잡음이 관찰되었고 개구 시 좀 더 큰 운동량을 보였다. (p=0.043) 관절잡음과 촉진 시 근육 통증, 하악 운동량에서 두 그룹 간 차이는 현저했다. 노인층에서 TMD에 대한 개구 시 엽발음, 근육 촉진 시 통증이 자주 관찰되는 반면 젊은 층에서는 하악 운동 시 관절잡음, 운동 시 개구량의 증가가 보다 많이 관찰되었다.

주제어: 연령, 유병률, 턱관절장애