

A hospital based observational assessment of the distribution of different temporomandibular joint disorders in complete dentures patients

¹Dr. Shashank Katiyar, ²Dr. Nilesh Pagaria, ³Dr. Partho Shankar Chakraborty,
⁴Dr. Deeplaxmi Dewangan, ⁵Dr. Ashish Dewangan

^{1,3}Assistant Professor, Department of Dentistry, Shri Shankaracharya Institute of Medical Sciences, Bhilai, Chhattisgarh, India

²Professor & Head Department of Dentistry, Shri Shankaracharya Institute of Medical Sciences, Bhilai, Chhattisgarh, India

⁴Reader, Department of Oral Medicine Diagnosis & Radiology, Rungta College of Dental Sciences and Research, Bhilai, Chhattisgarh, India

⁵Professor, Department of Dentistry, Shri Shankaracharya Institute of Medical Sciences, Bhilai, Chhattisgarh, India

Corresponding Author:

Dr. Ashish Dewangan

Abstract

Aim: To determine the prevalence of temporomandibular disorders (TMD) in patients wearing complete dentures (CD).

Material and Methods: This study was carried at the department of dentistry for a period of 1 year. 100 completely edentulous patients in the age group of 22-74 years who did not complain of any TMD and were denture bearers with a varied denture wearing span, were examined for TMD signs and symptoms included in the study.

Results: Out of a total of 100 subject sex amines, the majority of the patients is 28% fell in the age group of 50-60 years, followed by 40-50 years 22%. There was no statistically significant association between different genders and age ($P [\chi^2=1.722, P (\chi^2>1.722) = 0.9885$). In the distribution of patients with or without TMD, 61.67% of males out of the total male subjects and 65% of females out of total female subjects showed the presence of signs. The difference was found to be statistically insignificant ($P [\chi^2=0.347, P (\chi^2>0.365) = 0.5476$). 42% of the subjects had 1-3 years of edentulous span followed by 32% with more than 5 years of edentulous span and 26% of the subjects showed 3-5 years of edentulous span. 34% of the subjects showed limited mouth opening assign of TMD followed by jaw deviation which is shown by 27 (27%) of the subjects.

Conclusion: With an increase in the number of patients wearing CD, it becomes mandatory for dentists to be aware of the consequences of denture use over the anatomy and physiology of TMJ to provide quality prosthodontics treatment. The most common finding was limited mouth opening while crepitus and clicking were the least encountered.

Keywords: Occlusion, temporomandibular dysfunction, temporomandibular joint, signs, prevalence, denture wearer

Introduction

The phrase “temporomandibular disorders” grasps various clinical issues that include the muscles of mastication, the temporomandibular joint and related structures or both. These are otherwise called temporomandibular pain dysfunction disorders ^[1]. Etiology of temporomandibular joint dysfunction (TMD) is multifactorial and may involve changes in occlusion (malocclusion in dentate and posterior occlusal wear producing incisal interference

in complete denture [CD] wearers), faulty prosthesis (reduced vertical dimension), traumatic insult to TMJ, psychological components and parafunctional habits such as bruxism.¹³ Some predisposing factors which have been highlighted in recent studies are female gender and being edentulous for a long span of time without the denture^[1, 4, 5]. It has additionally been demonstrated that TMD changes over time, and no reasonable denouement has arrived yet about its natural progression or about the factors contributing to the evolution of TMD. In addition, the quantity of individuals who see subjective manifestations or signs of TMD is more than the quantity of individuals looking for treatment, and females will probably look for treatment more than male partners^[6, 7]. There are some controversial issues such as overclosure of the jaws in persons with natural dentition which can predispose to TMD whereas longstanding edentulous span individuals without dentures rarely develop TMDs despite overclosure. However, it is observed that edentulous individuals who do not gripe about TMD on an arbitrary examination may hint at least one or more signs of TMD, which may later form into a conspicuous joint dysfunction^[3]. Some signs of TMDs are facial pain, headache, pain over the joint, pain which aggravates while opening the mouth, muscle tenderness of musculature, pain which is to the angle of the lower jaw and cervical muscles, restricted mouth opening, deviation of the jaw while opening the mouth, crepitus, and clicking sounds in the joint region. These signs may appear in various combinations and degrees^[3, 4]. The role of occlusion to produce muscle spasms which may result in the above-mentioned signs does not apply to CD patients since malocclusion in dentures (e.g., centric prematurities) cannot trigger any proprioceptive response. Or maybe, the quick after effect of centric prematurity is displacement of the denture which acts as a buffer to secure the TMJ^[3]. The increase in the vertical measurement of dentures causes excessive extension of the jaw-closing muscles with increased pressure, which promotes TMD in edentulous individuals. Restoring freeway space emits muscle pain in CD patients and has been proved by Monteith^[8].

Material and Methods

This study was carried out in the department of at Department of Dentistry for the period of 1 year, after taking the approval of the protocol review committee and institutional ethics committee.

Inclusion criteria

- Healthy asymptomatic TMD patients.
- Completely edentulous.
- Patients wearing CD.

Exclusion criteria

- Patients with a single CD with opposing natural teeth.
- Patient with partially edentulous arch.

Methodology

After taking informed consent detailed history was taken from the Participant. one hundred completely edentulous patients in the age group of 22-74 years who did not complain of any TMD and were denture bearers with a varied denture wearing span, were examined for the existence of TMD signs and symptoms were included in the study. The subjects were examined by a single trained clinician for the specific study.

Statistical analysis

The recorded data was compiled and entered in a spreadsheet computer program (Microsoft Excel 2010) and then exported to the data editor page of SPSS version 19 (SPSS Inc., Chicago, Illinois, USA). Descriptive statistics included the computation of percentages.

Results

Out of the total 100 subjects examined, the majority of the patients that is 28% fell in the age group of 50-60 years, followed by 40-50 years 22% (Table 1). There was no statistically significant association between different genders and age groups ($P [\chi^2=1.722, P (\chi^2>1.722) = 0.9885$. Table 2 Show that the distribution of patients with or without TMD, 61.67% males out of the total male subjects and 65% females out of total female subjects showed the presence of signs. The difference was found to be statistically insignificant ($P [\chi^2=0.347, P (\chi^2>0.365) = 0.5476$).

Table 3 shows that 42% of the subjects had 1-3 years of edentulous span followed by 32% with more than 5 years of edentulous span and 26% of the subjects showed 3-5 years of edentulous span.

Table 4 summarized that majority of the subjects, i.e., 34 (34%) of the subjects showed limited mouth opening as a sign of TMD followed by jaw deviation which is shown by 27(27%) of the subjects. The signs which are least shown were crepitus and clicking with respective 3% and 4%.

Table 5 showed that 42% of the subjects (25 males and 17 females) had a combination of two signs of TMD followed by 31% of the subjects showing only one sign and 27% of the subjects showing a combination of more than two signs.

Table 1: Age and gender distribution of patients

| Age in years | Males | Females | Total |
|--------------|-------|---------|-------|
| Below 30 | 5 | 3 | 8 |
| 30-40 | 12 | 7 | 19 |
| 40-50 | 13 | 9 | 22 |
| 50-60 | 18 | 10 | 28 |
| 60-70 | 7 | 6 | 13 |
| Above 70 | 5 | 5 | 10 |
| Total | 60 | 40 | 100 |

$\chi^2=1.722, P (\chi^2>1.784)=0.9885$

Table 2: Distribution of Patients with or without TMD

| Presence or absence of signs | Males (%) | Females (%) |
|------------------------------|------------|-------------|
| Presence of signs | 37(61.67) | 26 (65) |
| Absence of signs | 23 (38.33) | 14 (35) |
| Total (%) | 60 | 40 |

$\chi^2=0.347, P (\chi^2>0.365) = 0.5476$. TMD: Temporomandibular disorders

Table 3: Distribution of patients based on edentulous span

| Edentulous span (years) | Number of subjects (%) |
|-------------------------|------------------------|
| 1-3 | 42 (42) |
| 3-5 | 26 (26) |
| >5 | 32 (32) |

Table 4: Distribution of TMD sings in CD wearers

| Signs | Males (%) | Females (%) | Total (%) |
|-----------------------------------|------------|-------------|-----------|
| Jaw deviation | 16 (26.67) | 11(27.5) | 27 (27) |
| Tenderness of masticatory muscles | 10 (16.67) | 6 (15) | 16 (16) |
| Tenderness in joint | 9 (15) | 7(17.5) | 16 (16) |
| Crepitus | 2 (3.33) | 1 (2.5) | 3 (3) |

| | | | |
|-----------------------|----------|----------|----------|
| Clicking | 2 (3.33) | 2 (5) | 4 (4) |
| Limited mouth opening | 21 (35) | 13(32.5) | 34 (34) |
| Total | 60 | 40 | 100(100) |

$\chi^2=1.189$, $P(\chi^2>1.189)=0.9265$. TMD: Temporomandibular disorders.
CD: Complete dentures

Table 5: Distribution of patients one or more sign of TMD

| Number of signs | Males (%) | Females (%) | Total (%) |
|--------------------|------------|-------------|-----------|
| One sign | 19 (31.66) | 12 (30) | 31 (31) |
| Two sign | 25 (41.67) | 17 (42.5) | 42 (42) |
| More than two sign | 16 (26.67) | 11(27.5) | 27 (27) |
| Total | 60 (100) | 40 (100) | 100 (100) |

$\chi^2=0.023$, $P(\chi^2>0.023)=0.9764$. TMD: Temporomandibular disorders

Discussion

This study was conducted to determine the prevalence of temporomandibular disorders (TMD) in healthy without any symptoms completely edentulous patients wearing CD and to accomplish the relationship of TMD signs with edentulous span. Some studies have found cases with CD with an increased prevalence of TMD symptoms in patients wearing CD than the individuals with natural dentition^[9, 10]. The present study showed that the majority of the subjects have limited mouth opening which is in accordance with the studies done by researchers which have also found a lesser prevalence of TMD in CD wearers^[11, 12]. Our study showed that there was no significant difference between the number of males and females showing signs of TMD, however, some studies assessing TMD in dentate individuals, partial denture wearers, and CD wearers have found significantly more severe TMD signs and symptoms in females than in males^[13-15]. The present study showed more percentage of patients 42% with two signs of TMD followed by patients presenting with one sign 31%. Which is in accordance with the studies conducted by Shetty and Al Zarea^[12, 13]. This study has also shown that the majority of the subjects, i.e., 34% showed limited mouth opening as a sign of TMD. Similar results were shown by some studies stating the reason for the muscular coordination needed to counteract relocation of the lower denture amid this exercise^[11]. In our study, the least common finding was crepitus 3% and clicking 4%, however, Kirov and Krastev showed contradictory results and found joint sounds (11.54%), muscle tenderness (7.69%), joint tenderness (5.77%), deviation of the mandible (3.85%), and limitation on mouth opening (2.88%) in decreasing order of frequency^[16]. The current study had shown that 63% of the subjects wearing CD showed the presence of signs of TMD which is in accordance with the results of the study conducted by Shi and Wang^[14]. In our study majority of the subjects have shown an edentulous span of 1-3 years and there was a decreased trend of signs with increasing edentulous span which is in accordance with the results of Al Zarea^[12].

The limitation of our study is that no standardized instrument or method was used to assess TMD prevalence and it did not differentiate TMD signs and symptoms. Future studies with larger study groups and standardized methods and instruments should be done to achieve proper conclusions.

Conclusion

With an increase in the number of patients wearing CDs, it becomes mandatory for dentists to be aware of the consequences of denture use over the anatomy and physiology of TMJ to provide quality prosthodontics treatment. The most common finding was limited mouth opening while crepitus and clicking were the least encountered.

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