

Temporomandibular disorders in North Indian population visiting a tertiary care dental hospital

ABSTRACT

Background: The terminology “temporomandibular disorders” (TMDs) encompasses a wide spectrum of conditions. Several hypothesized causes are occlusal disharmony, muscle hyperactivity, central pain mechanisms, psychological distress, and trauma. In day-to-day practice, TMDs had become more prevalent in Indian population due to changed dietary pattern and food habits, excessive stress of modern life, and other environmental causes. This study is an attempt to find the prevalence of TMDs in North Indian population.

Aims: The present study is taken into account to determine the prevalence of TMDs on the basis of signs and symptoms based on the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD).

Materials and Methods: The present cross-sectional study was conducted in the Department of Oral Medicine and Radiology. A total of 1009 patients aged between 6 and 80 years with a mean age of 42.04 ± 16.8 years seeking dental treatment from January 2016 to June 2017 were included in the study. All the patients were screened for TMD sign and symptoms. The demographic data and the signs and symptoms of TMDs were recorded in designed structured questionnaires which were based on the RDC/TMD criteria.

Results: The study population consisted of 1009 patients aged between 6 and 80 years. In the present study population, based on RDC/TMD criteria, the incidence of clicking sound (42.5%) was highest in TMD joint followed by deviation of mandible on mouth opening (40.8%), internal derangement (36.8%), myofascial pain dysfunction syndrome (33.7%), osteoarthritis (29.5%), crepitus (25.8%), joint tenderness (5.8%), and pain on mouth opening (4.8%).

Conclusion: Clicking sound was the most common sign of TMD disorders in Indian population.

Keywords: Internal derangement, temporomandibular disorders, the Research Diagnostic Criteria for Temporomandibular Disorders

INTRODUCTION

The term “temporomandibular disorders” (TMDs) encompasses a wide spectrum of signs and symptoms. There have been a lot of attempts to formulate a universally acceptable classification for categorization of this wide group of conditions. However, each classification or category has some shortfall or the other. Classifications have been attempted on the basis of anatomical changes, etiological factors, and by some researchers on the basis of the frequency of the presenting signs and symptoms. There has always been a considerable overlap in any classification system. TMDs affect the articulation of the condyle with the glenoid fossa, masticatory muscles, and the occlusion. There is a wide interplay between the above-mentioned factors,

and a thorough investigation of all possible factors should be done before a final diagnosis of TMD is made.^[1]

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Scientific investigation of TMDs began in the early 1950s. Earlier, it has been suggested that the improper occlusion could influence masticator muscle functions. Later, throughout the 1960s and 1970s, emotional stress and occlusal conditions were considered as the major etiologic factors of functional disorders of the temporomandibular joint disorders (TMJDs). Further with increasing research, it is commonly accepted that TMJ derangement is of multifactorial origin and is best thought of as the result of a combination of occlusal, neurophysiological, and psychological factors.^[2] Patients with TMDs usually suffer from muscle and/or joint pain on palpation, and on mandibular movements, joint sounds and the mandibular range of motion may be limited.^[3] The multifactorial TMJD etiology is related to emotional tension, teeth loss, occlusal interferences, masticatory muscular dysfunction, postural deviation, internal and external changes in TMJ structure, and the various associations of these factors.^[4]

TMD can affect any patients including children^[5] regardless of age or gender with varying signs and symptoms.^[6] However, due to the variation in symptoms among different patients and in the same patient at different times, the diagnosis of this clinical entity may be difficult.^[7] Epidemiological studies have estimated that approximately 50%–75% of the population exhibit signs of TMDs. Internal derangement (36.8%) may be subclinical and the patient might not try to relate this to an underlying jaw problem. In <15%–20% of the patients, the signs changed into symptoms for which the patient will seek treatment. The frequency to seek treatment increases if the symptoms interfere with day-to-day activities.^[1] The prevalence of TMD is high in general population (40%–60%).^[8]

Nowadays, with an increasing awareness and interest of the public toward oral health, there is a need to provide attention toward the TMJDs.^[9] TMJ issues can lie dormant in a patient. While some patients are not aware of their condition, many realize that they are experiencing something that is not normal in the TMJ but do not understand its future consequences or even worse as how to correct it. A sharp pain while eating or a loud click in the TMJ could be their warning call.^[10] Hence, there is a very much need to screen and scrutinize these patients and determine the prevalence of TMD in these patients. This cross-sectional study was done to assess and evaluate the prevalence of signs and symptoms associated with TMJDs as per the Research Diagnostic Criteria (RDC). This prevalence study will be the milestone and a paradigm for the future diagnosis and treatment plan for TMDs.

MATERIALS AND METHODS

The study was conducted from January 2016 to June 2017.

The demographic data and the signs and symptoms of TMDs were recorded in designed structured questionnaires which were based on the RDC/TMD criteria. The informed consent is obtained from all the patients and this study is approved by ethics committee. The RDC for temporomandibular disorders (RDC/TMD) is defined as a collective term describing a group of conditions affecting either the TMJ or the masticatory musculature or both. The signs and symptoms of TMDs include pain in the masticatory musculature and/or joint which can radiate and refer, locking closed, open lock, inability to open fully, dislocation, noises such as clicking and crepitus during joint movement, headache, tightness around the face in the morning, and referred pain to the ear. Males and females of age from 6 to 80 years were included in the study. Patients whose third molars have been extracted, patients with a history of fracture of the TMJ and previous TMJ surgeries, noncooperative patients, and patients with TMJ pathologies were excluded from the study.

Statistical analysis

Categorical variables were presented in number and percentage (%). Qualitative variables were compared using Chi-square test/Fisher's exact test as appropriate. $P < 0.05$ was considered statistically significant. The statistical analysis was done using Statistical Package for the Social Sciences version 21.0 (IBM corporation, Houston, TX, USA).

RESULTS

The study samples were selected randomly and consisted of 1009 patients aged between 6 and 80 years, with a mean age of 42.04 ± 16.8 years [Table 1]. The study population is divided into five age groups. Majority of the study participants belonged to 18–35 years of age group (22.5%) [Table 2]. Female patients (66.6%) dominated the study population than male patients [Table 3]. In the present study population, the incidence of myofascial pain dysfunction syndrome (MPDS) was 33.7% [Table 4] followed by osteoarthritis (29.5%) [Table 5], internal derangement (36.8%) [Table 6], clicking sound (42.5%) [Table 7], crepitus (25.8%) [Table 8], joint tenderness (5.8%) [Table 9], deviation of mandible in mouth opening (40.8%) [Table 10], and pain on mouth opening (4.8%) [Table 11].

DISCUSSION

TMDs are the principal cause for chronic facial pain. The term TMD has been epitomized as a cluster of disorders defined by pain in the preauricular area and TMJ or the masticator muscle limitation or deviations in mandibular range of motion, and clicking sound in the TMJ during mandibular function. TMDs are not pertained to growth or developmental disorders, systemic diseases, and macrotrauma.^[11] Schwartz^[12] defined

Table 1: The minimum, maximum and mean age in study population

| | <i>n</i> | Minimum | Maximum | Mean ±SD |
|-----|----------|---------|---------|--------------|
| Age | 1009 | 6 | 80 | 42.04±16.868 |

SD: Standard deviation

Table 2: The age group-wise distribution of study population

| Age groups (years) | Frequency (%) |
|--------------------|---------------|
| Below 18 | 42 (4.2) |
| 18-35 | 407 (40.3) |
| 36-50 | 227 (22.5) |
| 51-65 | 219 (21.7) |
| > 65 | 114 (11.3) |
| Total | 1009 (100.0) |

Table 3: Gender-wise distribution of study population

| Gender | Frequency (%) |
|--------|---------------|
| Male | 337 (33.4) |
| Female | 672 (66.6) |
| Total | 1009 (100.0) |

Table 4: Prevalence of MPDS in study population

| MPDS | Frequency (%) |
|-------|---------------|
| Yes | 340 (33.7) |
| No | 669 (66.3) |
| Total | 1009 (100.0) |

MPDS: Mandibular pain dysfunction syndrome

Table 5: Prevalence of Osteoarthritis in study population

| Osteoarthritis | Frequency (%) |
|----------------|---------------|
| Yes | 298 (29.5) |
| No | 711 (70.5) |
| Total | 1009 (100.0) |

temporomandibular pain dysfunction syndrome primarily as a symptom complex which is seen in young or middle-aged adults. Some of the signs are tenderness of the joint, dull pain which upsurges on mouth opening, muscle tenderness, referred pain to the angle of mandible and muscles of the neck, limited mouth opening, deviation on mouth opening, and joint sounds characterized by crepitus and clicking.

Emotional tension and occlusion play an unambiguous etiological role to produce muscle spasm which provokes these symptoms. Several opinions are conveyed in the literature whether occlusion is the cause or the result of the dysfunction or vice versa.^[13]

Feteih^[14] revealed TMD prevalence of 21.3% in 385 adolescents aged between 12 and 16 years. Thilander *et al.*^[15] showed prevalence to be 20% and 25% among adolescents. A meta-analysis published in 1993 on 51 random samples and selected TMD prevalence studies conducted from 1974 to 1991 showed clinically determined TMD frequency in the

Table 6: Prevalence of internal derangement in study population

| Internal derangement | Frequency (%) |
|----------------------|---------------|
| Yes | 371 (36.8) |
| No | 638 (63.2) |
| Total | 1009 (100.0) |

Table 7: Prevalence of clicking sound in study population

| Clicking sound | Frequency (%) |
|----------------|---------------|
| Yes | 430 (42.5) |
| No | 579 (57.5) |
| Total | 1009 (100.0) |

Table 8: Prevalence of crepitus in study population

| Crepitus | Frequency (%) |
|----------|---------------|
| Yes | 261 (25.8) |
| No | 748 (74.2) |
| Total | 1009 (100.0) |

Table 9: Prevalence of joint tenderness in study population

| Joint tenderness | Frequency (%) |
|------------------|---------------|
| Yes | 59 (5.8) |
| No | 950 (94.2) |
| Total | 1009 (100.0) |

Table 10: Prevalence of deviation of mandible on mouth opening in study population

| Deviation of mandible on mouth opening | Frequency (%) |
|--|---------------|
| Yes | 412 (40.8) |
| No | 597 (59.2) |
| Total | 1009 (100.0) |

range of 0%–93% (an average of 44%) and TMD prevalence in the range of 6%–93% (an average of 30%) based on the information obtained from questionnaires.^[16] Matsuka *et al.*^[17] stated that the prevalence of these symptoms was 24% and was thus higher than in other studies. A German study^[18] reported that 20 to 59-year-old women were significantly more frequently aware of joint sounds than men. Agerberg and Bergenholtz^[19] reported that the overall prevalence of clicking detected by clinical examination was 17% in men and 27% in women. A study was conducted in the county of Stockholm, Sweden, on persons aged 18–65 years and it was concluded that clicking sound is present in 21% of males and 28% of females; however, crepitus was detected in 26% of men and 40% of women.^[20] Gesch *et al.*^[18] reported that clicking and crepitus are present in 24.9% of the patients, with women having clicking sounds significantly more frequently than men almost twice (female [31.7%] vs. male [17.9%]). Tervonen and Knuutila^[21] reported that the rate of occurrence of clicking sound and crepitus was 20%; however, they did not describe gender- or age-dependent differences. However, a study conducted in Danish population concluded

Table 11: Prevalence of pain on mouth opening in study population

| Pain on mouth opening | Frequency (%) |
|-----------------------|---------------|
| Yes | 50 (4.9) |
| No | 959 (95.1) |
| Total | 1009 (100.0) |

that the rate of occurrence of crepitus and clicking joint was 15.4%. The predilection is 19% for females and 12.2% for males.^[22] A study conducted in Japanese population^[17] reported a higher prevalence of clicking (46%) and crepitation (19%) in their study sample. In the present study population, the incidence of MPDS was 33.7% followed by osteoarthritis (29.5%), internal derangement (36.8%), clicking sound (42.5%), crepitus (25.8%), joint tenderness (5.8%), deviation of mandible in mouth opening (40.8%), and pain on mouth opening (4.8%). These data will serve a milestone for the researchers and clinicians to carry out screening for TMDs and refer the affected patients for further treatment.

CONCLUSION

The temporomandibular joint disorders are very common in modern days due to changed dietary habits affecting younger population in majority. The temporomandibular disorders are most prevalent in younger age population (18-35yrs). Based on research diagnostic criteria, clicking sound in temporomandibular joint is most common clinical sign of temporomandibular disorders in Indian population.

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Conflicts of interest

There are no conflicts of interest.

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