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## Review Article

# A literature review on etiology and clinical management of disorders of temporomandibular joint

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## ABSTRACT

Disorders of temporomandibular joints falls in the category of degenerative musculoskel et al. conditions of the joints that are associated with the deformation in the form of function as well as morphology of the temporomandibular joint. It requires different diagnostic modalities for the diagnosis of the disorders of the temporomandibular joint. And for the treatment plan it requires specific and customized treatment plan according to the signs and symptoms of the patient. Literature stated that out of total population 25 % of the population is affected by the disorder of temporomandibular joint.

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## 1. Introduction

Diarthroidial joint is the other name of the temporomandibular joint. Temporomandibular joint is made up of mandibular condyles, glenoid fossa and articular eminence. Temporomandibular joint plays an important role in the movement of the mandible and it also helps in distributing the stress of the joint which is produced on daily work basis such as the process of mastication, chewing and speaking,<sup>1-5</sup> The abnormalities in relation to the intra articular position of the disc, dysfunction of the associated musculature, dysfunction of the joint also occurs in the form of the pain in the joint, limited movement of the joint, clicking sound while the opening or closing of the joint and deviation of the mandible while opening movement of the joint.<sup>6-9</sup> Literature revealed that the symptom of temporomandibular seen in 15 % to 59 % of the population,

but only 3 % to 6 % of the population required treatment for the disorder of the temporomandibular joint. Literature stated that the disorder of the temporomandibular joint occurs irrespective of the sexes, but the there is more occurrence of temporomandibular disorders in female as compared to the male patient with the ratio of 2:1 to 8:1. Most commonly disorder of temporomandibular joint affects between the age group of 20 years to 50 years.<sup>10,11</sup>

Most of the patient of the temporomandibular disorder got affected as malpositioning of disc of the temporomandibular joint which is known as internal derangement of the disc. Literature revealed that 54.2 % of the patients shows osteoarthritis in the affected joint cavity. The osteoarthritic changed that can be seen in the patient of the temporomandibular disorders are in the form of abrasion of the cartilage (articular), deterioration of the articular cartilage, thickening of the bone which is underlying, which leads to deformity of the joint and obstruction in the

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function of the temporomandibular joint.<sup>12,13</sup>

### 1.1. Etiology and diagnosis of the temporomandibular disorder

It has been seen that, when the capacity of the joint to remodeling has been exceeded osteoarthritis of the joint occurs. And in osteoarthritis of the temporomandibular joint, there occur change in shape of the components of the joints as well as change in the size of the different components of the joint. Osteoarthritis of the joint might also occur from excessive stress on the articulating structure and might also from decreased adaptive capacity of the different structures of the articulating disc. Literature stated that there is co relation between the internal derangement of the temporomandibular joint and osteoarthritis of the temporomandibular joint.<sup>8,10,12,14</sup>

### 1.2. Wilke's described stages of temporomandibular disorder as

1. Stage I: It includes painless clicking of the joint in early movement of opening and late movement in closing and there is no restriction in the movements of the mandible. Imaging of the joint reveals that there is displacement of the disc slightly forward and all the bony contours remains normal in the stage I.
2. Stage II: Pain in the joint occurs, not spontaneously but on occasions along with the clicking sound of the joint, sometimes intermittent locking of the joint occurs occasionally, patient also shows the symptoms of oro facial pain along with it. Imaging results shows that, there is slight derangement of the disc also. The bony contours of the articular disc remains normal in stage II.
3. Stage III: Locking of the joint becomes more frequent in the stage III of temporomandibular disorder, along with occurring of oro facial pain on frequent basis, and there occur restriction of the mandibular motion in all planes. On imaging of the temporomandibular joint, it was revealed that there is anterior movement of the disc but all the bony contours remain normal in this stage also.
4. Stage IV: In this stage, bony contours start changing. The pain present in this is of chronic type and there will be limited movement of the joint too. On imaging the disc which is displaced anteriorly shows thickening of the surface of the disc. There occurs abnormal bony contours of the condylar surface as well as abnormal bony contours of the articular surface.
5. Stage V: Patient suffers from chronic pain in the joint, crepitus, and totally restricted movement of the joint. On imaging, it was revealed that there will be thickening of the articular disc, there will be anterior displacement of the disc and as well as derangement of

the disc occurs. Thickening of the underlying articular bone occurs along with articular cartilage abrasion is seen.

It can stated that on clinical observation of the patient there are various factors that plays role in the progression of the temporomandibular disorder, so each case should be treated differently according to the clinical factors associated with it. Some of the different factors are like trauma to the joint, para functional habits of the patient, disturbed occlusion of the patient, increased joint friction, and functional over loading of the temporomandibular joint.<sup>15</sup> Various imaging modalities are also required for the diagnosis purpose which includes, starting from the basic OPG of the temporomandibular joint, arthrography, cone beam computed tomography, magnetic resonance imaging of the joint.<sup>16,17</sup> Various approaches of management of temporomandibular disorders as:

## 2. Non Invasive Treatment Modality

In non-invasive therapy of temporomandibular joint it includes starting from the basic, physiotherapy of the temporomandibular joint, in physiotherapy of the joint manual exercise of the joint can be done to increase the range of the motion of the joint and to increase the movement of the joint, along with it physiotherapist also guide and helps in the improvement of the patient posture, patient diet and helps in guiding or revealing the stress related habits of the patient. Along with it electro physical modalities can also be used it includes TENS, transcutaneous electric nerve stimulation, ultrasound and lasers also. They are helpful in reducing the inflammation of joint, thus helps in reducing the pain in the temporomandibular joint, these modalities also helps in increasing the blood flow in the joint area and also helps in promoting muscle relaxation. Occlusal splints can also be given in the initial non-invasive treatment modality, occlusal splints usually made of hard acrylic are more beneficial as compared to the splints made of soft materials, along with it occlusal correction should also be used to relieve the pain.

Pharmacological measure includes the usage of Non steroidal anti inflammatory drugs to relieve the pain, muscle relaxants can also be used to relieve the pain and helps in reducing the inflammation of the stretched muscle.

## 3. Minimally Invasive Technique

Minimally invasive technique used injections of corticosteroids, hyaluronate in the superior joint space most commonly used to treat the symptoms of osteoarthritis, along with it arthroscopy and arthrocentesis can be done. In invasive technique in which patient is not able to open his mouth and the movement of the joint is still limited than the patient has to undergo invasive treatment plan such as open joint surgery which includes discectomy,

reconstruction or reshaping of the articular surface or total joint replacement when there is joint degradation and pain threshold is over the patient perception. And in total joint replacement procedure alloplastic or autogenous graft material can be used during the surgery to fill any osseous bony defect. And the recent advancement in the treatment of temporomandibular disorder is a new technique of tissue engineering.<sup>11–18</sup>

#### 4. Conclusion

Temporomandibular joint is a very complex joint to understand. There are so many precipitating and along with it associating factors which may lead to disorders of the joint. One should have a thorough knowledge of the joint architecture as well as study of the etiological factor for the disorder. Each etiological factor is different for every individual.

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#### 6. Conflict of Interest

None.

#### References

- Junior RLM, Palma AJ, Marquardt EJ, Gondin TM, De Kerber FC. Temporomandibular disorders: a report of 124 patients. *J Contemp Dent Pract.* 2010;11(5):71–9.
- Goncalves DA, Fabbro ALD, Campos JA, Bigal ME, Speciali JG. Symptoms of temporomandibular disorders in the population: an epidemiological study. *J Orofac Pain.* 2010;24(3):270–8.
- Wilkes CH. Internal derangements of the temporomandibular joint. Pathological variations. *Arch Otolaryngol Head Neck Surg.* 1989;115(4):469–77. doi:10.1001/archotol.1989.01860280067019.
- Laskin DM, Greenfield W, Gale E. Report of the president's conference on the examination, diagnosis, and management of temporomandibular disorders. *J Am Dent Assoc.* 1983;106(1):75–7. doi:10.14219/jada.archive.1983.0020.
- Tanaka E, Detamore MS, Mercuri LG. Degenerative disorders of the temporomandibular joint: etiology, diagnosis, and treatment. *J Dent Res.* 2008;87(4):296–307. doi:10.1177/154405910808700406.
- Brooks SL, Westesson PL, Eriksson L, Hansson LG, Barsotti JB. Prevalence of osseous changes in the temporomandibular joint of asymptomatic persons without internal derangement. *Oral Surg Oral Med Oral Pathol.* 1992;73(1):118–40. doi:10.1016/0030-4220(92)90168-p.
- De Bont LG, Boering G, Liem RS, Eulerink F, Westesson PL. Osteoarthritis and internal derangement of the temporomandibular joint: a light microscopic study. *J Oral Maxillofac Surg.* 1986;44(8):634–77. doi:10.1016/s0278-2391(86)80075-1.
- Moffett BC, Johnson LC, McCabe JB, Askew HC. Articular Remodeling in the Adult Human Temporomandibular Joint. *Am J Anat.* 1964;115(1):119–60. doi:10.1002/aja.1001150108.
- Nitzan DW. The process of lubrication impairment and its involvement in temporomandibular joint disc displacement: a theoretical concept. *J Oral Maxillofac Surg.* 2001;59(1):36–45. doi:10.1053/joms.2001.19278.
- Petersson A. What you can and cannot see in TMJ imaging - an overview related to the RDC/TMD diagnostic system. *J Oral Rehabil.* 2010;37(10):771–8. doi:10.1111/j.1365-2842.2010.02108.x.
- Ahmad M, Hollender L, Anderson Q, Kartha K, Ohrbach R, Truelove EL, et al. Research diagnostic criteria for temporomandibular disorders (RDC/TMD): development of image analysis criteria and examiner reliability for image analysis. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2009;107(6):844–60. doi:10.1016/j.tripleo.2009.02.023.
- Mcneely ML, Olivo A, Magee S. A systematic review of the effectiveness of physical therapy interventions for temporomandibular disorders. *Phys Ther.* 2006;86(5):710–35.
- Gray RJ, Quayle AA, Hall CA, Schofield MA. Physiotherapy in the treatment of temporomandibular joint disorders: a comparative study of four treatment methods. *Br Dent J.* 1994;176(7):257–61. doi:10.1038/sj.bdj.4808429.
- Dimitroulis G, Gremillion HA, Dolwick MF, Walter JH. Temporomandibular disorders. 2. Non-surgical treatment. *Aust Dent J.* 1995;40(6):372–8. doi:10.1111/j.1834-7819.1995.tb04835.x.
- Mountziaris PM, Kramer PR, Mikos AG. Emerging intra-articular drug delivery systems for the temporomandibular joint. *Methods.* 2009;47(2):134–74. doi:10.1016/j.ymeth.2008.09.001.
- Nitzan DW, Price A. The use of arthrocentesis for the treatment of osteoarthritic temporomandibular joints. *J Oral Maxillofac Surg.* 2001;59(10):1154–63. doi:10.1053/joms.2001.26716.
- Laskin DM, Laskin DM, Greene CS, Hylander WL. TMDs an evidence-based approach to diagnosis and treatment; 2006. p. 476.
- Holmlund A, Hellsing G, Bang G. Arthroscopy of the rabbit temporomandibular joint. *Int J Oral Maxillofac Surg.* 1986;15(2):170–5. doi:10.1016/s0300-9785(86)80137-5.

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