Effects and Outcomes of Temporomandibular Joint Due to Wisdom Tooth Extraction

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ABSTRACT

Objective: To find out the effects and outcomes of temporomandibular joint due to wisdom tooth extraction.
Study Design: A cross sectional study.
Place and Duration of Study: University of Lahore Teaching Hospital and Lahore Dental Clinic, Lahore Pakistan, from May to Oct 2020.
Methodology: A total of 58 people were included in the study. Convenient sampling technique was used. The Temporomandibular Joint Disability Index Questionnaire was used to assess the extent of disability following wisdom tooth removal. The patients with wisdom tooth extraction minimum six months ago were included.
Results: Among the participants, 35 and 23 were males and females respectively in between age of 17-30 years with mean age of 23±3.21 years. These statistically significant results with communication by yawning or mouth opening which indicated difficulty in speaking after wisdom tooth extraction. Other factors were found with no effect on temporomandibular joint such as brushing or flossing, eating etc.
Conclusion: The individual's responses in their activities of daily life to communication and yawning or mouth opening were found statistically significant on temporomandibular joint disability index.

Keywords: Disability, Pain, Temporomandibular joint dysfunction.

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INTRODUCTION

Human beings have a wisdom tooth which is the last of three molar teeth. It usually appears during the age of 15 to 25 years. It doesn't present in the span of adulthood. When safe and correctly spaced, these teeth are a beneficial to a person's mouth, but they are often misaligned and need removal. The removal of these causes a variety of issues, with temporomandibular joint dysfunction being the most common.[1] Tempero-mandibular joint (TMD) disorders are multifactorial disorders in relation with some tooth loss or incorrect tooth appearance, occlusal involvement, inner stress, position changes, or any defect of the masticatory musculature and adjoining structures, extrinsic and intrinsic changes on TMJ structure.[2,3]

According to previous studies, the incidence and prevalence of effects on temporomandibular joint due to wisdom tooth extraction was 3.6%[4] and 21.25%.[5] the temporomandibular joint permits to shift up jaw upwards and downwards and side to side motion, it also allows us to speak, chew, and yawn. Temporomandibular disorders are problems with the jaw and the muscles that regulate it TMD.[6] The main components of this joint are temporomandibular ligament, stylomandibular ligament, sphenomandibular ligament, and lateral pterygoid muscle.[7] The third molar surgeries are carried out without any complications. Whereas, such surgeries may lead to severe difficulty to patients, like bleeding or hemorrhage, persistent, severe aches and inflammation, infection, dry socket which is known as alveolar osteitis, dent alveolar fracture, paresthesias of the lingual nerve or alveolar nerve, temporomandibular joint injury and even mandibular fracture.[8] The complications related to third molar surgery may be influenced by the age of the patient, level of pain, tooth impact level, medical history, smoking, surgeon's experience and quality of hygiene.[9] Pain is the prominent symptom, accompanied by limited jaw motion and crepitus, clicking or popping sound produces from the TMJ when the jaw is moved. TMD is not life threatening disorder, but sometimes symptoms can become chronic or difficult to handle that leads to put on negative impacts on person's life.[9,10]

The rationale of the study was to find out the effects and outcomes of impacted temporomandibular joint after wisdom tooth (third molar) extraction. This study focuses on the patients who have had under-

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gone the surgical procedure for impacted third molar. Previous studies have found out the prevalence of TMD, this study showed the outcomes and effects upon activities of daily living.

METHODOLOGY

This cross sectional study was conducted over time duration of 6 months from May 2020 to Oct 2020. The convenient sampling technique was used. Ethical letter was taken with the ltr no. PT/2020/REC/IRB/160. The data were collected from university of Lahore teaching hospital and Lahore dental clinic. The sample size was 58 calculated using Epi-tool with formula size=n=[z1-∞/2P(1-P)]/d² in which level of significance z1-∞/2= 1.96, margin error d=0.05 and expected population of variable P=0.90.[11] The data were collected after taking consent from the patients. The outcome measure used was Temporomandibular Joint Disability Index Questionnaire that is used for the functional activities and limitations of the TMJ. The patients included in the study that have had undergone surgery for wisdom tooth extraction at least 6 months ago. Both males and females with age between 17-30 years of were included.[12] The exclusion criteria were any congenital abnormality of mandible, dementia as this study was based on recall memory. Data were analyzed using SPSS version 21. Data were analyzed using SPSS version 21. The frequencies are mentioned with percentages(%). The association has been calculated using chi-square test in which *p*-value <0.05 found significant.

RESULTS

A total of 65 subjects were recruited in the study in which 7 subjects were not willing to participate hence the data collected from 58 patients in which 35 (60.3%) were males and 23(39.7%) were females with mean age 23±3.21 years. This study was retrospective as the patients had undergone wisdom tooth extraction and then on recall based information; they filled the temporomandibular joint disability index that include different functional factors such as talking /communication, chewing/eating and yawning/ mouth opening or closing etc.

Following shows the detailed description of significant results i.e. communication and yawning/ mouth opening. Table-I shows the effects on TMJ while talking that includes fatigue, discomfort during talking, feels pain and discomfort during talking, unable to talk due to pain, discomfort and fatigue & pain prevents from talking and it was found statistically significant with gender and found statistical significant i.e *p*-value <0.05. Table-II shows non specialized jaw activities such as yawning and mouth opening with a *p*-value of 0.01.

Table-I: Effects on communication after wisdom tooth extraction

Effects on communication after wisdom tooth extraction			
Characteristics	**Males**	**Females**	***p*-value**
Ccan talk as much as without pain, fatigue or discomfort	1(2.85%)	6(26%)	0.01
Talk as much as, but it causes some pain, fatigue and/or discomfort.	14(40%)	2(8.70%)	
Can't talk much because of pain, fatigue and/or discomfort	6(17.2%)	5(21.74%)	
Can't talk much at all because of pain, fatigue and/or discomfort	5(14.29%)	6(26%)	
Pain prevents me from talking at all.	9(25.71%)	4(17.4%)	

Table-II: Effects on communication after wisdom tooth extraction

Effects on communication after wisdom tooth extraction			
Characteristics	**Males**	**Females**	***p*-value**
Can yawn normally	1(2.85%)	8(34.8%)	0.01
Can yawn normally but sometimes with discomfort.	16(45.7%)	4(17.4%)	
Can open mouth but always with discomfort.	12(34.3%)	4(17.4%)	
Yawning and opening mouth wide causes restricted pain	5(14.3%)	2(8.69%)	
Yawning and opening mouth wide causes always moderate pain	1(2.85%)	5(21.7%)	

DISCUSSION

The purpose of this study was to find out the effects and outcomes of temporomandibular joint after wisdom tooth extraction. The results showed that subjects faced difficulty, pain and discomfort in TMJ due to wisdom tooth extraction while talking, chewing, eating, and laughing or during sleeping in which communication and mouth opening activites were found significant. This study shows the effects of undergoing extraction and impaction on TMD after wisdom tooth extraction.

The wisdom teeth, also known as molars, are the last teeth to appear in both sexes at the age of twenty years.[13] Women as old as eighty years old have seen their wisdom teeth fall up towards the end of their lives, causing excruciating pain, and men have had the

same experience.[11,14] While officially known as third molars, wisdom teeth get their name from the fact that they erupt much later than the other teeth, at an age when people are presumably "wiser" than when the other teeth erupt.[15,16]

According to a study by Macfarlane and colleagues, extrapolation of third molar teeth causes orofacial pain and discomfort, with patients who have had their teeth extracted for more than 8 years experiencing more pain and discomfort.[17] Similar findings were found in this study, where patients who had their wisdom teeth removed had varying degrees of temporomandibular joint disability. Most of the subjects had difficulty speech due to pain, fatigue and discomfort while talking.

Another research by Jhul et al., conducted in Denmark in 2009 looked at the signs symptoms and facts of TMD impairment after third molar removal, and patients claimed decreased joint mobility, increased pain severity, and muscle pain on palpation for up to six months. The study was prospective control study in which results calculated at the baseline and after six months in which significant association was found with TMD after wisdom tooth extraction while on the other hand untreated controls showed statistically insignificant association. The most common disability was jaw opening or jaw movements found in the study.[18] This present study focused on the normal activities such as talking, eating, brushing or flossing teeth and the effects of these movements on the TMJ after wisdom tooth extraction that showed varied results with each movement, hence causing a decrease in joint mobility and jaw movements.

A systematic review by Wai *et al.*, in Taiwan has briefly described the complications after wisdom tooth extraction in which the mentioned ones are surgical site infection, dry socket or prolonged TMJ symptoms. The most common one was the temporomandibular joint disability. They found out that most of the complications after impaction may settle down after one or two weeks but if they prolong, might set up for months. The results concluded that females had more complications than males. This study also concludes that temporomandibular joint disability is associated with wisdom tooth extraction and more commonly in those having complex surgical procedure. This review had cited that 1.7% patients had TMD symptoms after third molar or wisdom tooth extraction as compared to those did not go through wisdom tooth extraction.[4] This present study claims that wisdom tooth extraction has its effects over TMJ might causing pain and disability along with hindrance in activities of daily living, nocturnal disturbance or altered recreational activities.

A research study conducted in Malaysia in 2017 about the incidence of signs and symptoms of the temporomandibular joint after third molar extraction in which results were found statistically significant with the operative group those have had undergone wisdom tooth extraction. Along with, myofacial pain, clicking and trismus were also found. The study suggested difficult communication and mouth opening due to pain in the jaw.[2] This study also confirms the impact of TMJ on talking while communication or wide opening of mouth. One of the other study also concluded the same results that temporomandibular joint affects after third molar or wisdom tooth extraction.[19]

A study back in 2020 in India about the prevalence of TMD after third molar extraction has showed similar results as of this study. The data were collected through a self-made questionnaire in which results showed that 70% of patients reported TMD impaction after wisdom tooth extraction during their follow ups in which 20% had difficulty moving their mandible side to side, 20% reported having difficulty opening in mouth, 20% claimed about clicking sound while clenching their teeth and 10% were impacted with neck pain and stiffness.[9] This present study has focused on activities of daily living and its impact on TMJ using temporomandibular disability index in which most of the participants reported pain while talking, painful brushing or flossing or the patients have to be careful while doing these activities. This study showed that eating has been bound to soft foods due to discomfort while mouth opening or restricted opening.

The study should be on a larger scale with increased sample size. The clinical trials studies should also be conducted in order to monitor the symptoms of temporomandibular joint after wisdom tooth extraction.

Ethical Considerations

The informed consent was undersigned duly by all the participants. They had voluntary participation. Confidentiality was maintained in the study.

CONCLUSION

The individual's responses in their activities of daily life to communication and yawning or mouth opening were found statistically significant on temporomandibular joint disability index.

Conflict of Interest: None.

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Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

HAH & AA: Data acquisition, data analysis, critical review, approval of the final version to be published.

HS & ST: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

SS & SZH: Conception, data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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