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# ASSESSING THE NECESSITY OF ANTIBIOTICS AFTER LOWER WISDOM TOOTH REMOVAL: A COHORT STUDY

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**ABSTRACT**

**Background:** Lower wisdom tooth removal is one of the most common surgical procedures, use of antibiotics after lower wisdom tooth removal is debatable since the excessive advent of drug-resistant bacteria

**Objective:** The main purpose of this study was to examine the need for antibiotics used in routine after lower wisdom removal with osteotomy,

**Setting, Duration, Study Type**: Research was conducted in the Oral and Maxillofacial Surgery OPD in AIDC over the period of 6 months. The study type is Cohort.

**Materials and Methods:** This cohort study was conducted on 52 patients in the oral maxillofacial department. Each patient was recalled after 7 days of extraction. Eligibility criteria was patient between 21-60 years were considered for the study. Any patients with systemic disorder were excluded from the study. A clinical proforma was developed & validated which was then filled by 2 surgeons working in oral maxillofacial department along with consent form duly filled by every individual.

**Result:** 36.5% were male and 63.5% were female out of 52 patients while majority of patient's age were between 21-40. The majority of patients reported in OPD after vertical impacted wisdom extraction were with pain while only 2 patients came with pain & swelling, 1 with pain and pus and 1 with only swelling. Patients with swelling or pus had extraction of either horizontal or mesio-angular impaction having only 19% in combine. Majority of patient range under 31–40-year group. The majority in this group also came with pain while very few came with signs of infection.

**Conclusion:** Current study suggests that if the patient is coming without any infection or any factors contributing to risk of infection and co-morbities for extraction of lower molar extraction, use of pre and post antibiotics operatively is not necessary.

**Keywords:** Lower wisdom teeth, surgical extraction, osteotomy, follow-ups.

## INTRODUCTION

Antibiotic discovery was one of the most significant discoveries in medical history, serving as a crucial tool for treating infectious disorders and life-threatening postsurgical infections.[1] However, during the last few decades, antibiotics have been overused and misused, with these molecules being used indiscriminately to increase surgical success rates, cure presumed bacterial infections and avoid negligence lawsuits. These tactics, typically lacking scientific basis, were absorbed into regular clinical practice, and patients used antibiotics as a "drug of fear."[2]

Dentists and oral surgeons emphasize the importance of antibiotic prescriptions and the associated danger of antimicrobial resistance (AMR).[3] It is believed that 10% of antibiotic prescriptions are related to dental practice, and their usage is not always based on valid reasons and requirements.[4] A default antibiotic prescription for dental operations is still widely prescribed based on the old hypothesis of "oral focal sepsis", which implies mouth infections and/or oral surgical interventions as a probable cause of bacteremia and subsequent transmission of germs to other organs. One of the most frequently performed procedures in Oral Surgery is lower wisdom Removal (referred to as LWR). LWR is commonly followed by certain post-operativesequalae including but not limited to pain, swelling, bleeding, and reduced mouth opening.[5]"A common debate amongst clinicians is on whether to prescribe Antibiotics post operatively in a prophylactic role in order to eliminate or minimize the above-mentioned signs and symptoms.[6] Until recently the use of antibiotics after LWR was universally accepted and commonly practiced, however numerous studies have been conducted to identify a positive role of antibiotic administration in reducing the symptoms[7]. Numerous research done on this topic suggest that use of antibiotics after surgical LWR is not mandatory to prevent post-operativesequalae.[8] Secondly on a global scale the pandemic of drug-resistant microorganism is over wrought due to extreme indulgence in prescribing antibiotics.[9] There are a lot of studies on post-operative complication after lower wisdom extraction and factors contributing to it. But it is still a debate whether to prescribe medication after LWR.[10] There are many factors in contribution of post-extraction complications which include surgeon experience, patient with pre-operative infection, patient not following the doctor precaution after extraction and any co-morbities.[11] Hence this research is being conducted to prove that prescribing antibiotics after lower wisdom tooth extraction doesn't play significant or role to avert the post-operative complications.

The aim of this study was to check the common post-operative complication after LWR and do these complications need prescription of antibiotics or not.

## MATERIALS AND METHODS

This cohort study was conducted on 52 patients in the oral maxillofacial department, after obtaining the approval from ethical body of the institution (ERC/AIDC/2023/33) dated 11/04/2023. The sample size was calculated by using Arifin (2023) sample size calculator. Each patient was recalled after 7 days of extraction. Eligibility criteria was patient between age 21-60 year's were considered for the study. Selection of the patients were based on every 3rd person who came for lower wisdom extraction required osteotomy without any systemic disorders. Any patient with systemic disorder, pregnant women, patient allergic to any medication or to local anesthesia and having infection around the tooth which needed to be extracted were excluded from the study.

A clinical proforma was developed with the help of literature and 2 oral surgeons included in this research. After the clinical proforma, a pilot study was done on 10% of sample size to check the clarity of language and understanding. Modification was done accordingly. This clinical proforma was used to document all the parameters of the study. The proforma aiming to assess the post-operative sequalae of surgical removal of lower wisdom teeth without prescribing antibiotics will help in thorough analysis of the subject under investigation pre-operative and post-operative parameters will be assessed by the operating surgeon. The parameters include demography (patient name, age, gender, phone number, OPD number), History (containing every aspect like chief complain, history of presenting complain, medical and dental history, past history, family history), Clinical and radiographic findings, Classification of 3rd molar impaction on the basis of angulation, treatment procedure (number of cartridges, type of incision, type of flap, osteotomy & pre-operative

and post-operative findings (mouth opening, Redness, Temperature &Swelling with Pain + mouth opening). The proforma was filled by 2 surgeons working in oral maxillofacial department of FMDC along with consent form duly filled by every individual.

**Statistical Analysis:** Statistical analysis was conducted by calculating descriptive analysis (Frequency and percentages) & Pearson Chi-square to compare among groups using SPSS version 29 Software.

## RESULT

Table 1 shows that out of 52 patients, 36.5% were male and 63.5% were female while majority of patient's age were between 21-40. Significant results in table 2 show that majority of patient reported in OPD after wisdom extraction were with pain and vertical impaction while only 2 patients came with pain & swelling, 1 with pain and pus and 1 with only swelling. Patients with swelling or pus had extraction of either horizontal or mesio-angular impaction having only 19% in combine.

**Table 1: Demography**

| **Variables** | | Frequency | Percent |
|---|---|---|---|
| Gender | Male | 19 | 36.5 |
| | Female | 33 | 63.5 |
| Age (in years) | 21-30 | 20 | 38.5 |
| | 31-40 | 21 | 40.4 |
| | 41-50 | 5 | 9.6 |
| | 51-60 | 5 | 9.6 |
| | >60 | 1 | 1.9 |

**Table 2: Parameters and radiographic Crosstabulation**

| | | Horizontal | Mesio-angular | Vertical | Total |
|---|---|---|---|---|---|
| Pain | Follow-up | 5 | 11 | 29 | 45 |
| | % | 71.4% | 78.6% | 93.5% | 86.5% |
| Pain & limited mouth opening | Follow-up | 0 | 0 | 1 | 1 |
| | % | 0.0% | 0.0% | 3.2% | 1.9% |
| Pain & pus | Follow-up | 0 | 1 | 0 | 1 |
| | % | 0.0% | 7.1% | 0.0% | 1.9% |
| Pain & red | Follow-up | 0 | 1 | 0 | 1 |
| | % | 0.0% | 7.1% | 0.0% | 1.9% |
| Pain & swelling | Follow-up | 2 | 0 | 0 | 2 |
| | % | 28.6% | 0.0% | 0.0% | 3.8% |
| Red & pain | Follow-up | 0 | 0 | 1 | 1 |
| | % | 0.0% | 0.0% | 3.2% | 1.9% |
| Swelling | Follow-up | 0 | 1 | 0 | 1 |
| | % | 0.0% | 7.1% | 0.0% | 1.9% |
| Total | Follow-up | 7 | 14 | 31 | 52 |
| | % | 100 | 100 | 100 | 100 |
| Asymptotic Sig. using Pearson chi-square | | .029 | | | |

Overall significant relation is found between gender and parameter which shows 84.2% of male while 87.9% of female reported with pain. Only 16% of male and 12% of female reported with either swelling or pus or pain with swelling (table 3).

**Table 3:Gender**

| Gender | | | Horizontal | Mesio-angular | Vertical | Total | Pearson Chi-square |
|---|---|---|---|---|---|---|---|
| Male | pain | Follow-up | 1 | 3 | 12 | 16 | .041 |
| | | % | 50.0% | 75.0% | 92.3% | 84.2% | |
| | Pain & limited mouth opening | Follow-up | 0 | 0 | 1 | 1 | |
| | | % | 0.0% | 0.0% | 7.7% | 5.3% | |
| | Pain & swelling | Follow-up | 1 | 0 | 0 | 1 | |
| | | % | 50.0% | 0.0% | 0.0% | 5.3% | |
| | Swelling | Follow-up | 0 | 1 | 0 | 1 | |
| | | % | 0.0% | 25.0% | 0.0% | 5.3% | |
| | Total | Follow-up | 2 | 4 | 13 | 19 | |
| | | % | 100.0% | 100.0% | 100.0% | 100.0% | |
| Female | pain | Follow-up | 4 | 8 | 17 | 29 | .189 |
| | | % | 80.0% | 80.0% | 94.4% | 87.9% | |
| | Pain & pus | Follow-up | 0 | 1 | 0 | 1 | |
| | | % | 0.0% | 10.0% | 0.0% | 3.0% | |
| | Pain & red | Follow-up | 0 | 1 | 0 | 1 | |
| | | % | 0.0% | 10.0% | 0.0% | 3.0% | |
| | Pain & Swelling | Follow-up | 1 | 0 | 0 | 1 | |
| | | % | 20.0% | 0.0% | 0.0% | 3.0% | |
| | Red & pain | Follow-up | 0 | 0 | 1 | 1 | |
| | | % | 0.0% | 0.0% | 5.6% | 3.0% | |
| | Total | Follow-up | 5 | 10 | 18 | 33 | |
| | | % | 100.0% | 100.0% | 100.0% | 100.0% | |
| Total | pain | Follow-up | 5 | 11 | 29 | 45 | .029 |
| | | % | 71.4% | 78.6% | 93.5% | 86.5% | |
| | Pain & limited mouth opening | Follow-up | 0 | 0 | 1 | 1 | |
| | | % | 0.0% | 0.0% | 3.2% | 1.9% | |
| | Pain & pus | Follow-up | 0 | 1 | 0 | 1 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | % | 0.0% | 7.1% | 0.0% | 1.9% | |
| | Pain & red | Follow-up | 0 | 1 | 0 | 1 | |
| | | % | 0.0% | 7.1% | 0.0% | 1.9% | |
| | Pain & swelling | Follow-up | 2 | 0 | 0 | 2 | |
| | | % | 28.6% | 0.0% | 0.0% | 3.8% | |
| | Red & pain | Follow-up | 0 | 0 | 1 | 1 | |
| | | % | 0.0% | 0.0% | 3.2% | 1.9% | |
| | Swelling | Follow-up | 0 | 1 | 0 | 1 | |
| | | % | 0.0% | 7.1% | 0.0% | 1.9% | |
| | Total | Follow-up | 7 | 14 | 31 | 52 | |
| | | % | 100.0% | 100.0% | 100.0% | 100.0% | |

Again, overall significant relation is shown between parameters and age group with majority of patient range under 31–40-year group. Majority in this group also came with pain while very few came with sign of infection (table 4).

**Table 4: AGE Group**

| Age | | | Horizontal | Mesio-angular | Vertical | Total | Pearson Chi-square |
|---|---|---|---|---|---|---|---|
| 21-30 | pain | Follow-up | 4 | 5 | 7 | 16 | .418 |
| | % | % | 80.0% | 62.5% | 100.0% | 80.0% | |
| | pain, pus | Follow-up | 0 | 1 | 0 | 1 | |
| | | % | 0.0% | 12.5% | 0.0% | 5.0% | |
| | pain, red | Follow-up | 0 | 1 | 0 | 1 | |
| | | % | 0.0% | 12.5% | 0.0% | 5.0% | |
| | pain, swelling | Follow-up | 1 | 0 | 0 | 1 | |
| | | % | 20.0% | 0.0% | 0.0% | 5.0% | |
| | swelling | Follow-up | 0 | 1 | 0 | 1 | |
| | | % | 0.0% | 12.5% | 0.0% | 5.0% | |
| | Total | Follow-up | 5 | 8 | 7 | 20 | |
| | | % | 100.0% | 100.0% | 100.0% | 100.0% | |
| 31-40 | pain | Follow-up | 0 | 4 | 14 | 18 | .001 |
| | | % | 0.0% | 100.0% | 87.5% | 85.7% | |
| | pain, limited mouth opening | Follow-up | 0 | 0 | 1 | 1 | |
| | | % | 0.0% | 0.0% | 6.3% | 4.8% | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | pain, swelling | Follow-up | 1 | 0 | 0 | 1 | |
| | | % | 100.0% | 0.0% | 0.0% | 4.8% | |
| | red, pain | Follow-up | 0 | 0 | 1 | 1 | |
| | | % | 0.0% | 0.0% | 6.3% | 4.8% | |
| | Total | Follow-up | 1 | 4 | 16 | 21 | |
| | | % | 100.0% | 100.0% | 100.0% | 100.0% | |
| 41-50 | Pain | Follow-up | | 1 | 4 | 5 | |
| | | % | | 100.0% | 100.0% | 100.0% | |
| | Total | Follow-up | | 1 | 4 | 5 | |
| | | % | | 100.0% | 100.0% | 100.0% | |
| 51-60 | Pain | Follow-up | 1 | 1 | 3 | 5 | |
| | | % | 100.0% | 100.0% | 100.0% | 100.0% | |
| | Total | Follow-up | 1 | 1 | 3 | 5 | |
| | | % | 100.0% | 100.0% | 100.0% | 100.0% | |
| >60 | Pain | Follow-up | | | 1 | 1 | |
| | | % | | | 100.0% | 100.0% | |
| | Total | Follow-up | | | 1 | 1 | |
| | | % | | | 100.0% | 100.0% | |
| Total | pain | Follow-up | 5 | 11 | 29 | 45 | |
| | | % | 71.4% | 78.6% | 93.5% | 86.5% | |
| | pain, limited mouth opening | Follow-up | 0 | 0 | 1 | 1 | |
| | | % | 0.0% | 0.0% | 3.2% | 1.9% | |
| | pain,pus | Follow-up | 0 | 1 | 0 | 1 | |
| | | % | 0.0% | 7.1% | 0.0% | 1.9% | |
| | pain, red | Follow-up | 0 | 1 | 0 | 1 | |
| | | % | 0.0% | 7.1% | 0.0% | 1.9% | .029 |
| | pain, swelling | Follow-up | 2 | 0 | 0 | 2 | |
| | | % | 28.6% | 0.0% | 0.0% | 3.8% | |
| | red, pain | Follow-up | 0 | 0 | 1 | 1 | |
| | | % | 0.0% | 0.0% | 3.2% | 1.9% | |
| | swelling | Follow-up | 0 | 1 | 0 | 1 | |
| | | % | 0.0% | 7.1% | 0.0% | 1.9% | |
| | Total | Follow-up | 7 | 14 | 31 | 52 | |

## DISCUSSION

Result of this study shows that it is unnecessary to prescribe antibiotics to patient after LWR as common post-operative complain which patient faces is pain. So, instead of antibiotics a good analgesic will be enough after extraction. It is still very controversial to say that antibiotics are not necessary when surgical extraction is performed. This study shows that very few patients came with post-operative infections and the majority of patients came with pain for which a good analgesic will be enough to reduce the post-operative pain.

Galvão et al in 2025[12] support our result that antibiotics is not always required pre- and post-operatively. This study shows that there were no consistent changes in vital signs and body temperature. Yes, there was some transient changes in blood pressure, heart rate and oxygen saturation but all of it were not clinically significant. There was swelling in some participants on second pre-operative day which was subside on 7th day. These participants were taking piroxicam. Studies shows that piroxicam reduces swelling post-operatively even in surgeries where bone removal is done. All the result of this study suggest that antibiotics is not necessary after LWR. A study in 2025 by Ribeiro et al[13] suggest that antibiotics after LWR can cause adverse effects like nausea, stomachache, drowsiness, and trembling. In 2025 there were a study by Fagoni et al,[14] which suggest that prophylaxis antibiotics is not necessary in LWR. Even when comparing C-reactive protein (CRP) levels between a group having placebo and a group having amoxicillin pre- and post-operative surgery showed that there was no difference among the groups. This suggest that antibiotics is not always necessary before and after LWR. But when comparing the CRP of traumatic surgery, there was an increase in CRP level on second postoperative day. This was because of aseptic inflammation due to traumatic surgery. In such situation, antibiotics can be prescribed post-operatively.

A study by Yadav et al in 2025[15] suggest that antibiotics treatment had beneficial effect in reducing postoperative complication. According to this research, antibiotics reduce the need of analgesic postoperatively. Although this study, support antibiotics after lower molar extraction but still not recommend prolong use of antibiotics. This study further supports the concept that if good analgesic and anti-inflammatory is prescribed then antibiotics prescription can be avoided due to side effects. Few studies suggest that post-operative infection after 3rd molar extraction were usually due to some participating factors or trigger factors. One of the factors can be the experience of doctors. Studies showed that there were more cases of infection after lower molar extraction when it was done by students as compared to experience doctors[16]. Another factor is sterilizing the clinical field and team using povidone iodine and 0.12% chlorhexidine reduces the risk of infection. One factor was the present of pre-operative infection or previous history of infection also increase the risk of infection post-operatively. Another factor that may increase the likelihood of infectious complications is the presence of previous infection. Singh et al. 2018[17] suggested that extraction of asymptomatic 3rd molar prophylactically reduces the risk of infection post operatively.

Like current study, Cervino et al in 2019[18] suggest that the most common post-operative complication of extraction of impacted 3rd molar is pain. For postoperative pain, good analgesic will be enough to prescribed. Poeschl et al, 2004[19] compares post-operative pain level between a group which was prescribe antibiotic (antibiotic group) and a group which was not prescribed antibiotics (control group). The result of this study favors the concept of prescribing antibiotic after extraction as it reduced the risk of post-operative pain. Few similar comparisons were made in studies like Yanine et al in 2021[20] suggest that 40% of antibiotic group and 6.1% of control group experience pain after extraction. McGregor et al in 2024[21] shows no post-operative complication in antibiotics groups. All these studies were in favor of antibiotics prescription after lower molar extraction to reduce pain. The reason of contradiction of these studies with our present study was that our study suggest that postoperative infection is very least in patients so antibiotics used is abandoned cause prolong used can be dangerous. And for post-operative pain good analgesic and anti-inflammatory is enough.

## LIMITATION

The present study has some limitations and strengths. Limitation included that it was conducted in only one institute. Because of its generalizability, the result is reduced which means that study can't be the proper representer of the whole population requiring lower molar extraction. As only specific area patients visited the institute, there is chances that there might be more to explore if the study was multicentered.

## CONCLUSION

Current study suggests that if the patient is coming without any infection or any factors contributing in risk of infection and co-morbities for extraction of lower molar extraction, use of antibiotics pre and post operatively is not necessary.

### Recommendation

Study should be conducted on multi-centered institute of Pakistan to improve generalizability and external validity.

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