

Acute Pericoronitis and its Effect on Health Related Quality of Life: Systemic Review

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Abstract

Background: Pericoronitis is inflammation of the tissue surrounding partially erupted tooth (most common lower third molar). This study aimed to evaluate the effects of acute pericoronitis on quality of life (QoL), in terms of oral health and lifestyle.

Aim of Study: The aim of this study was to assess the changes in perception of quality of life of patients with acute pericoronitis.

Material and Methods: A systematic search was performed in PubMed, Google Scholar, Embase, the Cochrane library, and Web of Science, for studies that investigated on quality of life (QoL) in patients with symptomatic pericoronitis. After extracting data, the pooled sensitivity, specificity, constructed summary receiver operating characteristics curve and positive likelihood ratio were estimated. 1436 abstracts were reviewed after duplication removal and subsequently the full text of the 110 articles was obtained according to the inclusion criteria.

Results: 11 studies were considered eligible after full-text review. Subgroup analysis was used to go further into the source of heterogeneity. The results revealed that there was significant improvement in homogeneity in subgroups classified by state, p -value, imaging techniques, and other factors (ChI = 91.21, $p < 0.00001$, I² = 89%), according to the subgroup analysis.

Conclusion: Pericoronitis pain had clinically significant associations with patients' lifestyle and tooth function. Symptomatic pericoronitis might have adverse implications, limiting quality of life and causing pain.

Key Words: Pericoronitis – Inflammation – Third molar – Systematic review – Quality of life.

Introduction

THE degree of ease of completing daily activities such as eating, speaking, socialising, and sleeping linked with an oral health issue is measured using procedures that measure oral health-related quality of life (OHQoL). The results of the OHQoL assess-

ment may aid clinicians in making treatment options that improve patients' everyday lives [1].

Pericoronitis is a painful disorder that affects one's quality of life. It is caused by inflammation of the tissue surrounding the partially erupted third molar. Pericoronitis is most typically associated with the third molars in the mandible [2]. Pericoronitis symptoms can range from moderate to severe, with severe instances causing fever, dysphagia, face edoema or cellulitis, trismus, and enlargement of lymph nodes [3].

Patients with pericoronitis, on the other hand, may endure considerable pain. Pericoronitis is usually treated by extraction the partially-impacted tooth, which leads in the condition being completely resolved [2]. Pericoronitis that isn't infected normally doesn't require antibiotic treatment [4].

The goal of nonsurgical treatment for pericoronitis is to alleviate the symptoms of inflammation, although the risk of future recurrence is still a concern. However, because to postoperative complications such as pain, edoema, and trismus, third molar surgery might result in functional limits and discomfort. Surgical removal of the third molar has been found in previous research to impair quality of life in the immediate postoperative period [5].

Despite being advised that medically treated pericoronitis is likely to recur in the future, patients may choose not to have surgery due to special occasions such as holidays, vacations, exams, and work initiatives. Patients who are given the choice to safe third molar may prefer to wait until they have recurrent pericoronitis before undergoing surgical intervention [6].

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Patients in these situations frequently seek medicine for short-term pain relief in the hopes of feeling better and returning to their normal routine. Nonsteroidal anti-inflammatory medications (NSAIDs) have been the analgesics of choice for pericoronitis because of its anti-inflammatory effect [7]. However, no previous studies comparing the effects of oral and topical NSAIDs on the quality of life of individuals with symptomatic pericoronitis have been conducted. The most commonly recommended systemic NSAIDs in our practise are diclofenac and flurbiprofen. Benzydamine is a topical nonsteroidal anti-inflammatory drug (NSAID) that is used to treat oral inflammation [7].

NSAIDs are known to induce gastrointestinal problems when taken orally, which is one of the main reasons for their limited use [8]. Topical NSAIDs, on the other hand, have a lower risk of gastrointestinal toxicity and other unpleasant side effects [9].

This meta-analysis study aims to assess the changes in perception of quality of life of patients with acute pericoronitis.

Material and Methods

The related studies were found using a systematic search in PubMed, Google Scholar, Embase, the Cochrane library, and Web of Science. The following search string combinations were used: used: ("acute pericoronitis") and ("quality of life") and ("dentistry").

Study selection:

The search strategy identified 1226 studies, and after the removal of duplicates and title and abstract screening process, 96 studies were retrieved. Full-text analysis was performed for these 110 studies were considered as being eligible for inclusion in our review. 11 studies involved quantitative research and reported the number and percentages Inclusion criteria specified that subjects be 18 to 35 years old, have an American Society of Anesthesiologists health risk assessment of level I or II, and have mild signs or symptoms of pericoronitis, which included spontaneous pain, purulence or drainage, or localized swelling, affecting at least 1 mandibular third molar. In addition, those with a medical condition contraindicating periodontal probing, an acute illness, a history of antibiotic treatment within the past 2 months, generalized Class IV periodontal disease according to the American Academy of Periodontology, and tobacco use were excluded. A total of 11 studies were included for analysis. In addition, the reference list of these 11 studies was reviewed.

Statistical analysis:

True-positive, false-positive, false-negative, and true-negative results were extracted from each study before data pooling, and the sensitivity, specificity, positive likelihood ratio (PLR), negative likelihood ratio (NLR), and corresponding 95 percent confidence intervals (95 percent CIs) were calculated. The sensitivity, specificity, PLR, and NLR were summarised using the bivariate random-effects model.

Results

There were 1436 potential article citations in the preliminary literature review (Fig. 1). 1226 of these studies were immediately excluded because they were irrelevant, or were published in languages other than English according to the exclusion criteria. The full text of the remaining 110 articles was downloaded for a more thorough examination. Following the full-text reading, 99 articles were eliminated. Eventually, 11 previously published papers were chosen based on the inclusion and exclusion criteria of the present study.

As shown in Table (1), raw data of 4,726 patients were extracted from 11 clinical trials selected from 1,226 articles. The mean duration time of neuropathic pain was more than one months. Studies included focal neuro pathic pain, generalized pain like fibromyalgia. Our results demonstrated a statistically significant ($p<001$).

Use if tissucol provides a lower incidence of postoperative neuralgia and earlier resumption of daily activities, analgesic impact with pain improvement according to the mean percent reduction in pain analog.

As shown in (Fig. 2): Quality assessment of the included studies using the Quality Assessment of Diagnostic Accuracy Studies. The red bar indicates high risk of bias; the yellow bar indicates unclear risk of bias; and the green bar indicates low risk of bias. In the lower part, details of quality assessment were shown. Green circle with '+' indicates low risk of bias or low concern for applicability; yellow circle with '?' indicates unclear risk of bias or unclear concern for applicability; red circle with '-' indicates high risk of bias or low concern for applicability.

Figure (4): Forest plot of the pooled sensitivity and specificity for the included studies. Black solid horizontal lines indicate 95% CIs of each individual studies. dashed line indicates the pooled sensitivity or specificity for all 11 studies. The grey boxes with central blue dots indicate the sensitivity or specificity for each individual study.

Table (1): Characteristics of included randomized controlled trials.

Author	Year	Country	No. of patient	Type of study	Aim	Conclusion
1-Ren and Malmstrom	2021	England	2,932	Review	To collect and evaluate all randomized controlled clinical trials in English and non-English literature, published or unpublished, and to test the hypothesis through metaanalysis.	Systemic antibiotics given before the surgery were effective in reducing the frequencies of AO and wound infection after third molar surgery.
2-Pepper et al.,	2018	Italy	478	Retrospective	To compare the management of pericoronitis in military personnel on Operation Herrick with that in non-deployed personnel.	Pericoronitis accounted for a large proportion of antibiotic prescriptions in both groups, with no significant difference in usage.
3-Yurttutan et al.,	2019	Turkey	128	Retrospective	To assess the changes in perception of QoL of patients with mild pericoronitis after treatment by surgical and periodontal approach over a six-month study period in an attempt to answer the following question: Is extraction of third molars necessary?	These data suggest that QoL can be improved, particularly with respect to pain and oral function, without extraction of the third molars with symptomatic periodontal inflammatory disease confirmed by clinical examination. These outcomes may be surprising for clinicians who routinely manage these problems with extraction, but the increase in the QoL of the patients was faster in the surgical treatment group. However, in the case of recurrence of pericoronitis during longer-term follow-up
4-Majid	2011	Iraq	33	Retrospective	To evaluate the effect of dexamethasone injection (intramuscular and submucosal) on patients' QOL in the immediate postoperative period among patients requiring surgical removal of the lower third molars.	Submucosal injection of dexamethasone 4 mg is an effective therapeutic strategy for improving the quality of life after surgical removal of impacted lower third molars with a comparable effect on postoperative sequelae to intramuscular injection. It offers a simple, safe, painless, noninvasive, and cost-effective therapeutic option for moderate and severe cases.
5-Magraw et al.,	2015	China	113	Prospective	To assess the association between subjects' pericoronitis pain symptoms and quality of life outcomes for Oral function and Lifestyle.	Clinically important correlations existed between subjects' pericoronitis pain, and Oral function and Lifestyle, associations not often considered by clinicians, policy makers, or the public. The persistence of these correlations over a three-month interval highlights the chronic, episodic nature of pericoronitis
6-Yurttutan	2018	Turkey	85	Prospective	Aim of the study is to evaluate and compare surgical and conservatively managed third molars with mild pericoronitis at first, third, and sixth months; we also aimed to rate quality of life of patients with Oral Health Impact Profile-14 (OHIP-14) index.	Periodontal treatment of mandibular third molar teeth may be effective in reducing symptoms, but the factor is not eliminated, tooth extraction seems to be more successful at long term

Table (1): Count.

Author	Year	Country	No. of patient	Type of study	Aim	Conclusion
7-Eroglu et al.,	2018	Turkey	40	Prospective	To determine whether antimicrobial photodynamic therapy combined with antibiotic therapy is clinically and histologically superior to antibiotic therapy alone in pericoronitis treatment.	Antimicrobial photodynamic therapy combined with antibiotic therapy for pericoronitis treatment was found to be more successful as compared with the antibiotic therapy alone regarding clinical and histological outcomes.
8-Ibikunle and Adeyemo	2017	Nigeria	124	Prospective	To evaluate the role of IVIM and diffusion kurtosis imaging (DKI) in identifying pathologic complete response (pCR) and T stages after neoadjuvant chemoradiotherapy (nCRT) in locally advanced rectal cancer (LARC).	Surgical extraction of mandibular third molars is associated with worsening of patients' postoperative QoL in the immediate postoperative period. Prospective patients should be informed about this, and ways of reducing this untoward effect should be explored.
9-Alalwani et al.,	2019	Turkey	60	Prospective	To evaluate the effects of oral and topical analgesic nonsteroidal anti-inflammatory drugs (NSAIDs) on oral health-related quality of life (OHQoL), in terms of oral health and lifestyle, in patients with symptomatic pericoronitis	Topical benzydamine was found to be a more effective alternative to oral NSAID analgesics, diclofenac and flurbiprofen, in improving OHQoL in patients with pericoronitis.
10-Pepper et al.,	2019	england	720	Retrospective	To compare the management of pericoronitis in military personnel on Operation Herrick with that in non-deployed personnel.	Pericoronitis accounted for a large proportion of antibiotic prescriptions in both groups, with no significant difference in usage. A wisdom tooth was significantly more likely to be removed on deployment than at HB, and this likely reflects the effort to treat OpH emergency patients definitively on the day they attended, thereby reducing risk-laden travel and impact on operational effectiveness
11-Zhang et al.,	2018	China	13	Retrospective	To compare the fingerprinting patterns of these 2 clinical conditions.	The results suggest that the diversity of pericoronal pocket microbiota in asymptomatic pericoronitis cases differs markedly from that of symptomatic cases

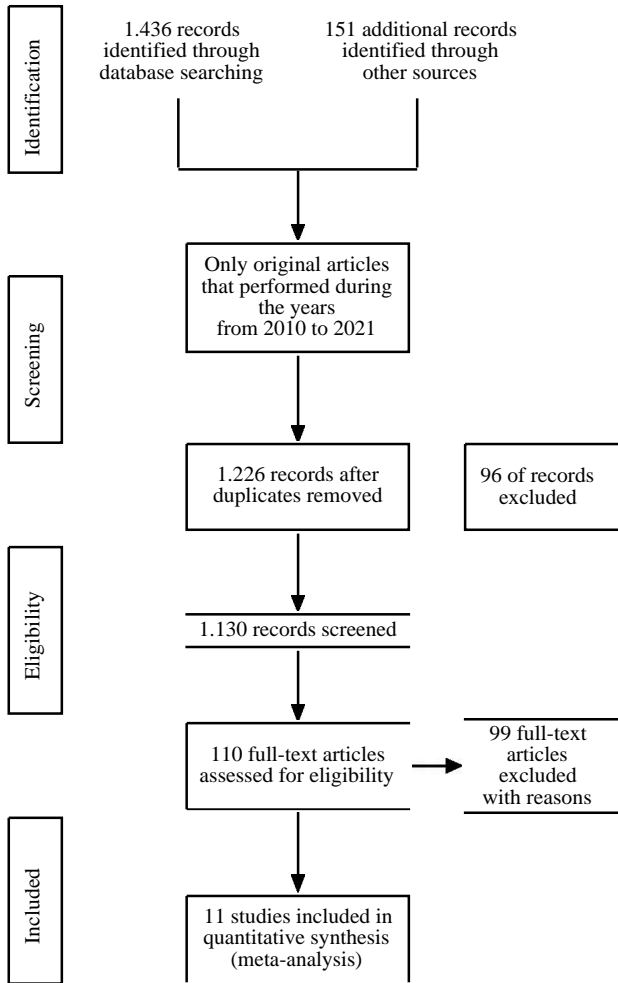


Fig. (1): PRISMA Flow diagram of the study.

	Risk of Bias			
	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding of participants and personnel (performance bias)	Incomplete outcome data (attrition bias)
Alalwan et al., 2019	+	+	-	+
Eroglu et al., 2018	+	-	?	+
Ibikunle and Adeyemo 2017	+	+	+	-
Magraw et al., 2015	+	-	+	+
Majid 2011	?	+	+	-
Pepper et al., 2018	+	+	+	-
Pepper et al., 2019	-	+	+	+
REN and MALMSTROM 2021	-	?	+	+
Yurttutan 2018	+	-	+	+
Yurttutan et al., 2019	+	+	+	-
Zhang et al., 2018	+	?	+	+

Fig. (2): Risk of bias summary: Review authors' judgements about each risk of bias item for each included study.

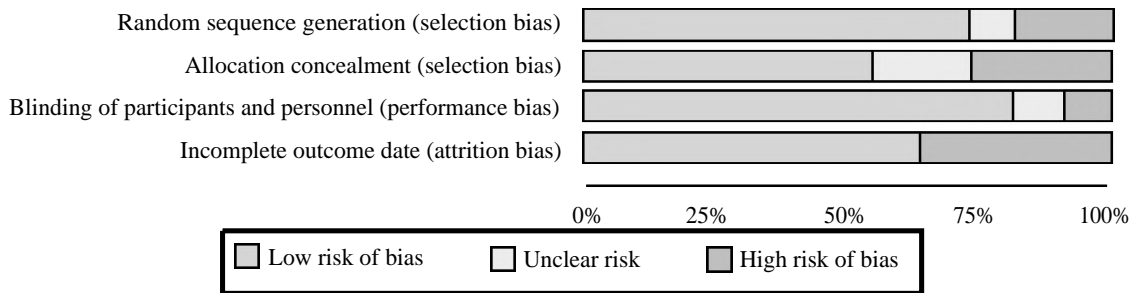


Fig. (3): Risk of bias graph: Review authors' judgements about each risk of bias item presented as percentages across all included studies.

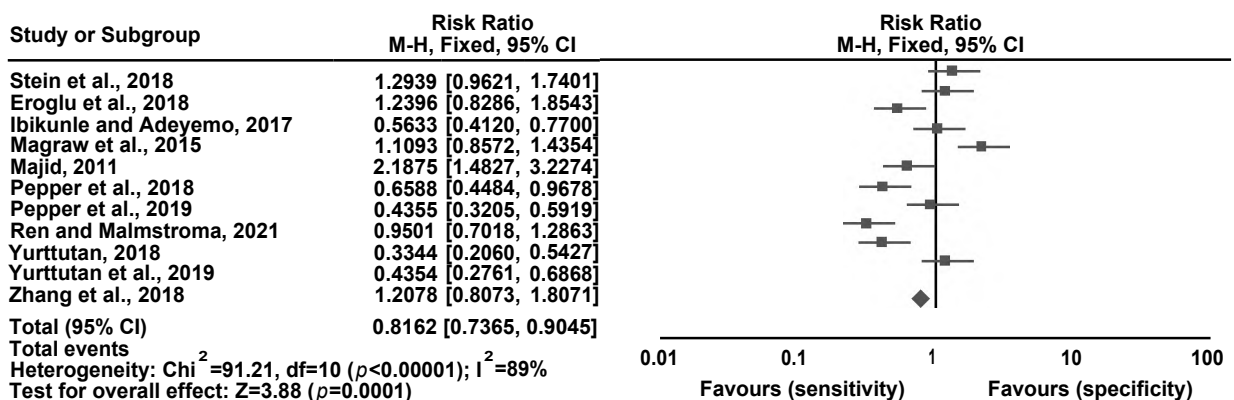


Fig. (4): Forest plot of comparison.

Discussion

Dentists are concerned about the complications of extraction of third molars (pain, swelling, bleeding, periodontal disease, soft tissue or temporomandibular joint injuries, jaw fractures, alveolitis, oroantral fistulas, trismus, and nerve injury) before deciding to proceed with an operation, so different physicians may make widely differing decisions about the same patient. The quality of life of a patient may be harmed as a result of intraoperative and postoperative difficulties associated with the extraction of lodged third molars [10].

On understanding of the impact of pericoronitis on quality of life beyond symptoms of pain, there was clinically important correlations existed between assessments of subjects' pain outcomes and those in the lifestyle and oral function domains [11].

In the present meta-analysis, 75% of the studies were of low risk of bias regarding the random sequence generation (selection bias), while more than 50% of the studies were of low risk of bias regarding the allocation concealment (selection bias), while more than 75% of the studies were of low risk of bias regarding blinding of participants and personnel (performance bias), and incomplete outcome data (attrition bias).

Regarding the heterogeneity between studies, the 11 included studies demonstrated significant heterogeneity with $p < 0.00001$ using X^2 test. The heterogeneity for the sensitivity (9 of 89) was higher compared with that for specificity (9 of 89). In addition, there was threshold effect found (correlation, 3.88; proportion of heterogeneity due to threshold effect, (3.88), ($p = 0.0001$).

The results revealed that there was significant improvement in homogeneity in subgroups classified by state, b -value, imaging techniques, and other factors. ($Chi^2 = 9.121$, $p < 0.00001$, $I^2 = 89\%$).

Conclusion:

Pericoronitis pain had clinically significant associations with patients' lifestyle and tooth func-

tion. Symptomatic pericoronitis might have adverse implications, limiting quality of life and causing pain.

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إلتهاب حوائط التاج الحاد وتأثيره على نوعية الحياة المتعلقة بالصحة

خلفية الدراسة: إلتهاب حوائط التاج هو إلتهاب فى الأنسجة المحيطة بالسن المقتطع جزئياً (الأكثر شيوعاً ضرس الثالث السفلى). هدفت هذه الدراسة إلى تقييم آثار إلتهاب غلاف التاج الحاد على جودة الحياة، من حيث صحة الفم ونمط الحياة.

الهدف من الدراسة: تقييم التغيرات فى الإدراك لنوعية الحياة للمرضى المصابين بالتهاب حوائط التاج الحاد.

منهجية الدراسة: تم إجراء بحث منهجى فى PubMed و Google Scholar و Embase ومكتبة Cochrane و Web of Science للدراسات التى بحثت فى جودة الحياة (QoL) فى المرضى الذين يعانون من أعراض التهاب حوائط التاج. بعد استخراج البيانات، تم تقدير الحساسية المجمعمة والنوعية ومنحنى خصائص تشغيل مستقبل الملخص المنشأ ونسبة الاحتمالية الإيجابية. تمت مراجعة ١٤٣٦ ملخصاً بعد إزالة التكرار، وبإلتالى تم الحصول على النص الكامل للمقالات ١١٠ وفقاً لمعايير التضمين.

نتائج الدراسة: إعتبرت ١١ دراسة مؤهلة بعد مراجعة النص الكامل. تم استخدام تحليل المجمعمة الفرعية للذهاب إلى أبعد من ذلك فى مصدر عدم التجانس. أظهرت النتائج أنه هناك تحسناً معنوياً فى التجانس فى المجمعمات الفرعية المصنفة حسب الحالة والقيمة الاحتمالية وتقنيات التصوير وعوامل أخرى ($Chi^2=91.21, p<00.00001, I^2=89\%$) وفقاً لتحليل المجمعمة الفرعية.

الإستنتاج: ألم التهاب حوائط التاج له إرتباطات مهمة سريرياً مع أسلوب حياة المريض ووظيفة الأسنان. قد يكون لالتهاب حوائط التاج المصحوب بأعراض آثار سلبية، مما يحد من جودة الحياة ويسبب الألم.