

CURRENT EVIDENCE REGARDING THE EFFICACY OF PROPHYLACTIC ANTIBIOTICS IN THE MANAGEMENT OF FACIAL FRACTURES

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ABSTRACT

Fractures of the facial region are commonly treated by surgeons operating in the head and neck. Antibiotic prophylaxis is used by these surgeons to decrease the rate of infections, however the role of prophylactic antibiotics remains controversial. Evidence exists for the beneficial use of prophylactic antibiotics for tympanostomy, orthognathic surgery and third molar surgeries. Unfortunately there is little evidence regarding the efficacy of prophylactic antibiotics in the management of facial fractures. In numerous cases no clear benefit of antibiotic prophylaxis has been shown, particularly considering their potential adverse side effects. The aim of this paper is to present the available evidence regarding the efficacy of prophylactic antibiotics in the management of facial fractures.

KEYWORDS

Prophylactic antibiotics, Facial fractures, Maxillofacial trauma, Infection.

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INTRODUCTION: Facial fractures vary in severity and location. They also include a range of wound classifications like clean, clean contaminated, contaminated and dirty/infected. However the role of prophylactic antibiotics remains controversial. It is clear the actively infected facial fractures should be treated with therapeutic antibiotics. It is a well-known fact that there is wide spread and considerable variability in the use, type, timing and duration of the use of prophylactic antibiotics. Therefore it is important to review the current evidence for the role of prophylactic antibiotics in facial fractures. This would enable the surgeons treating facial fractures to focus on evidence based medicine as well as to reduce the health care costs.

LITERATURE REVIEW: In 2006 Andreasen et al¹ performed a systematic review of four randomized controlled trials (RCT). The four RCTs significantly demonstrated that prophylactic antibiotics decreased the rate of infection in mandibular fractures by three fold. Other studies which were included found no benefit of post-operative prophylactic antibiotics given longer than 24-48 hours for mandibular fractures. Specific antibiotics like cefazolin, penicillin and ceftriaxone which were included in the studies were found to be effective. In another study which evaluated other facial fractures in addition to the mandibular fractures it was concluded that due to low risk of post-operative infection prophylactic antibiotics were not indicated for fractures of zygoma, maxilla or mandibular condyle.

In a RCT done by Miles, Potter and Ellis 2006² of open mandibular fractures treated with open reduction and

internal fixation (ORIF) it was found that the infection rates were 9.8% and 14% for the antibiotic and no antibiotic groups respectively. This study concluded that there was no statistical ($p=0.399$) benefit for the administration of post-operative prophylactic antibiotics in patients undergoing ORIF of open mandibular fractures.

Knepil and Loukota 2010³ evaluated the outcomes of prophylactic antibiotics following surgical treatment of zygomatic fractures in 134 patients. The overall post-operative infection rate was 1.5% with infections occurring only after trans oral surgical approaches. This study indicated that the post-operative infection rate of zygomatic fractures is very low.

Lauder et al 2010⁴ retrospectively evaluated the timing of antibiotic prophylaxis in 223 patients in facial fractures other than mandibular fractures and concluded that there is no increased benefit ($p=0.248$) of antibiotic prophylaxis for non-mandibular facial fractures outside the perioperative time frame except in multiple or open fractures.

In 2011 Kyzas⁵ specifically evaluated the quality of literature regarding the use of antibiotic prophylaxis in the treatment of mandibular fractures. The overall percentage of post-operative infection ranged from 4.5% to 62% when no antibiotics were used and 1.9% to 29% when antibiotics were used. The review concluded that the current evidence supporting the use of prophylactic antibiotics in the treatment of mandibular fractures is limited and of doubtful quality. The author warned that no standard protocol can be recommended, however the literature to a certain extent supports the superiority of prophylactic antibiotics over no treatment.

A Cochrane review⁶ published in 2012 concerning third molar extractions in 2456 cases concluded that there was significant reduction of infections with perioperative prophylactic antibiotics. Danda 2012⁷ evaluated eight studies involving orthognathic surgeries and concluded that patients who received antibiotic prophylaxis with short term

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post-operative antibiotics had a significant higher risk of wound infection compared with patients receiving extended term post-operative antibiotics (11.2% versus 3.8%) respectively.

In a meta-analysis by Hochman et al 2006⁸ with a total of 716 ears and 1344 patients, the effect of antibiotics after tympanostomy was assessed. The authors concluded that topical antibiotics were able to reduce the incidence of post tympanostomy otorrhoea (as a sign of surgical site infection) by about 48%. A statistically ($p=0.000$) significant benefit was seen in the use of topical antibiotics in the collective result.

CONCLUSION:

1. Current evidence supports the use of prophylactic antibiotics in open mandibular fractures from the time of injury until the completion of perioperative course with no additional benefit in the post-operative period.
2. Literature also supports the use of prophylactic antibiotics in third molar surgery, orthognathic surgery and tympanostomy, however literature does not support the use of prophylactic antibiotics for fractures involving maxilla, zygoma and mandibular condyle.
3. A large multicentre, high quality RCT is needed to evaluate the type, timing, duration, dosage and effectiveness of prophylactic antibiotics in the management of facial fractures.

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