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Original Research

Efficacy Of Antibiotics In Infection Of Craniofacial Region- An Original Research

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ABSTRACT:
Aim: To examined efficacy of antibiotics in infection of craniofacial region. **Objective:** Given the scarcity of data on prophylactic antibiotic use and infection rates after zygomatic bone fracture surgery, we conducted an audit to assess the utilization and outcomes of antibiotic prophylaxis in zygoma fracture surgeries. **Methodology:** The study investigated 66 patients impact of antibiotic prophylaxis on surgeries for zygomatic bone fractures. Data collection was conducted prospectively during two cycles of clinical audits. The collected data were methodically analyzed, with a particular focus on categorizing fractures into distinct groups. **Result:** Our study focused on young patients, with a 3% infection rate (2/66). Infections, from intra-oral zygomatic bone reduction, were minor and treated with oral antibiotics. Limited evidence exists for prophylactic antibiotics in maxillofacial surgery. 97% (64/66) with implants received prophylaxis; indiscriminate use poses risks. 74% (49/66) received perioperative antibiotics; 14% (7/49) extended. Prudent antibiotic decisions are vital in zygomatic bone fracture management, considering risk and evidence to mitigate complications. **Conclusion:** Surgeons require comprehensive understanding of antibiotic prophylaxis for zygomatic bone fractures. Established principles assess infection risks, including contamination, implant use, operation duration, and co-morbidities. Prudent prophylaxis involves nuanced decisions, considering risks and evidence, to minimize SSI risks.
Keywords: antibiotic prophylaxis, facial fracture, infection, surgery, craniofacial trauma

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INTRODUCTION

The significance of the human face is unique and unmatched, effortlessly fusing form and purpose. The face is the body part that has the strongest relationship with our identity out of all of them. The fact that 3 million people suffer from craniofacial trauma annually highlights how crucially important this area is (1). Notably, the head and neck play a special role in human wellbeing, with roughly half of all injuries requiring rapid medical attention occurring in emergency departments. Surgery is commonly necessary for the treatment of craniomaxillofacial fractures, which poses a significant public health concern due to the difficulties and financial costs (2). In the modern era of organized healthcare, hospitals are now expected to closely monitor and occasionally restrict the use of antibiotics in patients having surgery. A more thorough examination of surgical antibiotic prescription practices is warranted due to worries about potential side effects of antibiotic therapy, the effectiveness of antibiotics in specific circumstances, the development of antibiotic resistance, failure to adhere to antibiotic regimens, and the need to control costs (3). Despite stricter healthcare laws, doctors still have a large amount of autonomy and a unique approach to their clinical

practice. Prior to surgery (from the time of the injury or initial presentation up to the time of the surgery), during surgery (immediately before the procedure and sustained throughout, commonly referred to as "prophylactic" antibiotics, not exceeding 24 hours after the procedure), or after surgery (extending beyond the perioperative period) are some of the different phases in which antibiotics can be administered (4). Different situations involving craniofacial fractures, such as the possibility of sinus infection contaminating the fracture site, fractures exposed to intraoral bacteria due to mucosal tears, and delays in fracture management, inherently imply the possibility of benefits from using antibiotics both before and after surgery. The precise antibiotic prescription practices of craniofacial surgeons are largely unknown and may vary from the more general recommendations for surgical antibiotic use (3). The essential rules for prescribing antibiotics underline that prophylaxis should only be taken into account when there is a significant risk of infection and when there is convincing proof that antibiotics can reduce that risk. A regional assessment was therefore carried out to determine the standard method for prescribing antibiotics during zygomatic fracture surgeries. This audit was designed to record the results of post-operative surgical site infections (SSIs) and the subsequent removal of surgical plates.

AIM

This study aims to address the dearth of information on prophylactic antibiotic usage and infection rates post-surgery for zygomatic bone fractures. By conducting an audit, we intend to examine the utilization and results of antibiotic prophylaxis in zygoma fracture surgeries, filling a crucial gap in current understanding.

METHOD

The methodology used in this study was a rigorous and complete approach to assessing the influence of antibiotic prophylaxis on zygomatic bone fracture procedures. During two cycles of clinical audits, data was collected prospectively. Following the initial audit cycle, local rules for antibiotic prescription were implemented to establish a baseline. In following research, these criteria were used as the gold standard for examining prescribing practices. Data collection was a multi-step process that included capturing demographic and surgical information during the surgical operation. Following that, a thorough evaluation of patient data was performed 25 days after surgery to discover instances of surgical site infections (SSI) or plate removal. Patients with single zygomatic complex or zygomatic arch fractures were included, as were those receiving surgery reduction with or without plating. Patients with conditions such as coronal flap, injuries needing antibiotics, orbital floor repair, or non-operatively managed fractures, on the other hand, were eliminated. The data was meticulously evaluated, with a special emphasis on classifying fractures into various groups. Group A had solitary zygomatic arch fractures, whereas Group B included zygomatic complex fractures that did not require mini-plate fixation. Except for the zygomatico-maxillary buttress, Group C included zygomatic complicated fractures requiring mini-plate repair. Finally, zygomatic complicated fractures requiring mini-plate repair, including plating of the zygomatico-maxillary buttress, were included in Group D.

RESULT

The study included information from 66 patients and illuminated several facets of surgical treatment and antibiotic administration. Patient ages varied greatly, ranging from 15 to 80 years old, with a 33-year average age at fracture. Fractures were frequently operated on between 1 and 24 days after injury, or an average of 8 days later. Within 25 days of surgery, two SSI cases among patients were discovered, and both required therapeutic antibiotic treatment. The first patient, a 22-year-old man, had intra-oral incision for zygomatic arch fracture reduction. The erythematous and swollen infection responded nicely to outpatient oral antibiotic therapy without drainage. The second, 24, reported drainage and swelling after having a zygomatic complicated fracture fixed with mini-plates. Successful resolution was achieved with per-oral antibiotics, avoiding incision and drainage. Notably, co-fluampicil antibiotics were used to treat both SSI patients rather than metronidazole. Additionally, none of the patients required plate removal throughout the post-operative period, providing additional information about plate retention outcomes. The 66 patients in this study's patient cohort provided a wealth of information about managing fractures, the efficacy of antibiotics, and managing post-operative infections. The focus on SSI cases highlighted the critical function of customized antibiotics and reaffirmed the significance of sensible antibiotic approaches in craniofacial surgical scenarios.

Table 1 The use of antibiotics and their results:

	Group A		**Group B**		**Group C**		**Group D**	
Antibiotic prophylaxis	**` Yes**	**No**	**` Yes**	**No**	**` Yes**	**No**	**` Yes**	**No**
Number of infections	1	0	0	0	0	0	1	0
Total number of patients	7	5	6	10	29	1	8	0

Table 2 Antibiotic course durations:

	Group A	Group B	Group C	Group D
No antibiotics	5	10	2	0
Induction only	5	4	2	1
Short course: 4 doses or less	2	3	21	7
Long course: 5-7 days	1	0	6	0

DISCUSSION

The facial skeleton is prone to zygomatic bone fractures, so treating surgeons must have a thorough awareness of when to prescribe antibiotic prophylaxis. When patients are at a high risk for surgical site infection (SSI), established general prophylactic principles should be used combined with antiseptic treatments (5). The likelihood of developing SSI is influenced by variables such contamination level, implant insertion, operation length, and co-morbidities affecting the American Society of Anesthesiology (ASA) grade (6). Based on the surgical approach—trans-cutaneous or trans-oral—procedures for these fractures can be classified as clean or clean-contaminated. The risk of infection is typically low during clean surgeries on healthy patients, hence antibiotic prophylaxis is not usually necessary. Our infection rate was 3% (2/66), and the majority of the patients in our trial were young people with low ASA scores. Instances of intra-oral zygomatic bone reduction, which is classified as clean-contaminated, have resulted in infections. These infections were small, and oral antibiotics treated them. Antibiotic prophylaxis needs supporting data to be effective. There are few published studies and weak levels of evidence on the effectiveness of prophylactic antibiotics in maxillofacial fracture surgery (7). In our series, preventive antibiotics were given to 97% (64/66) of the patients with implants, with one patient developing SSI. Extended antibiotic courses during head and neck surgery are associated with an increased incidence of methicillin-resistant Staphylococcus aureus, and indiscriminate preventive antibiotic usage carries concerns (8–10). In our series, 74% (49/66) of the patients received perioperative antibiotics, and 14% (7/49) of them were on an extended course. In essence, addressing zygomatic bone fractures requires a grasp of antibiotic prophylaxis indications. The study emphasizes the complex decision-making process that must be used to minimize SSI risks and related problems, taking contamination risk, surgical strategy, and supporting evidence into account.

CONCLUSION

Surgeons must have a solid understanding of antibiotic prophylaxis in order to treat zygomatic bone fractures. Regarding contamination, implant use, the length of the procedure, and co-morbidities, established principles handle infection concerns. Fractures are categorized surgically as clean or clean-contaminated. 3 percent of intra-oral reduction infections were successfully treated with oral antibiotics. There isn't enough support for the prophylactic use of antibiotics for implants (97%). MRSA risk is increased by unwarranted use. 74% of patients received perioperative antibiotics; 14% required longer courses. To reduce the incidence of SSI, proper prophylaxis depends on thoughtful decisions that take into account risk factors and evidence.

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