



Out-patient surgical prophylaxis Prospective study

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Abstract

Antibiotic prophylaxis in oral surgery is well established practice; still there is no specific protocol followed in Iraqi dental surgical centers. The aim of this study is to compare between efficiency of 3 prophylactic protocols in preventing post operative infection and reducing healing period in out patient's oral surgical procedures. Forty four patients, selected from the attendants of oral surgery clinic in college of dentistry Almustansiriyah University, were subjected to different oral surgical procedures (45 operations) under local anesthesia. These patients were given single dose antibiotic prophylaxis in 3 groups; 1st group were given 1 million i.u. of procaine penicillin (15 cases), 2nd group were given 500 mg ampicilline vial (15 cases), 3rd group were given 1 gm amoxicillin (15 cases). The maximum time for all procedures was 2 hours. We conclude that there is no difference between ampicilline (500mg), procaine penicillin (1 million i.u.), and Amoxicillin (1 gm) regimens concerning post operative infection, while patients of the 1st group healed in a shorter period than other two groups.

Key words: surgical prophylaxis, out patient dental surgery, antibiotic

Introduction

Antibiotic prophylaxis is defined as 'the administration of any antimicrobial agent that prevents the development of disease ⁽¹⁾. Antibiotic prophylaxis is only one relatively minor effort among numerous preventive measures, but the efficacy and impact of antimicrobial prophylaxis has clearly been demonstrated to be significant Miles and Burke ^{(2) (3)} in the late 1950s were able to show that infections could be prevented only when antimicrobials were given prior to or at the time of the infection challenge, which has been proven by several studies in the last two decades and widely accepted ⁽⁵⁾. Antibiotic given 3h following a

challenge with infectious bacteria were ineffective in preventing infection ⁽⁴⁾. Those findings led to formulate principles for giving the prophylactic antibiotics.

So, in 1990, Peterson L.J ⁽⁵⁾ listed the following Principles of using antibiotic prophylaxis:

1. The surgical procedure should have a significant risk of infection.
2. The correct antibiotic for the surgical procedure should be selected.
3. The antibiotic level must be high.
4. The timing of the antibiotic administration must be correct.

5. The shortest antibiotic exposure must be employed ⁽⁵⁾.

Ronald K. Woods, and E. Patchen Dellinger ⁽⁶⁾ added other criteria for the selection of the antimicrobial agent, which are (a) cause minimal side effects (b) be relatively inexpensive ⁽⁶⁾. On the other hand, microbiology of the infection should be well known in order to choose the suitable antimicrobial agent ⁽⁴⁾.

The American college of surgeons considered trans-oral wound is clean contaminated, that is, Class II, which means that those wounds are free from contamination and do not need protection except in the following conditions: (a) the patient has depressed host defenses. (b) A prosthetic device is being inserted. (c) The sequel of an infection is serious; and (d) some aspect of the procedure, such as increased duration or decreased local blood supply, makes infection more likely ^{(4) (7)}. It is generally agreed that antibiotic prophylaxis is warranted in all procedures in the categories of clean-contaminated, contaminated or dirty ⁽⁵⁾. When antibiotic prophylaxis is decided, the antibiotic must be given in a dose high enough to reach a level that is four to five times the minimum inhibitory concentration MIC for the expected organisms. It is important also that the plasma level dose not drop bellow (MIC). In the out patient setting, the concentration remains relatively stable for about 2 hours, falling rapidly after that the tissue level is actually higher than the serum level at 2 hours ⁽⁴⁾.

Aim of study

To compare between efficiency of 3 prophylactic protocols in preventing post operative infection and reducing healing period in out patients oral surgical procedures

Materials and methods

Forty four patients were selected from the attendant of oral surgery clinic in college of dentistry Almustansiriyah University. Most of the patients are the residents of neighborhood. The criteria of selection depend on absence of medical history and active infectious process.

After taking a thorough history, clinical and radiographic examination were carried out for those patients, 45 oral surgical procedures were done under local anesthesia (two of them were done for the same patient). These operations include removal of impacted lower 3rd molar, apicectomy and enucleation of odontogenic cysts. All these procedures involve bone and soft tissue surgeries.

The number of female patients was 24, male patients were 20 Patient. age groups were recorded as follows (- 10): 0 patient, (11-20): 13 patients, (21-30): 20 patients, (31-40): 8 patients, (41-50): 2 patients, (51-60): 2 patients. All surgical procedures were done under local anesthesia in oral surgery theater, these procedures categorized as follows; removal of impacted lower third molar (A two-sided flap incision was performed, osteotomy of the bone and when it was necessary dental section was carried out before its extraction): 25, Apicectomy: 16, Cyst enucleation: 4.

After operation, patients were given single dose antibiotic prophylaxis in 3 groups, 1st group were given 1 million i.u. of procaine penicillin (15 cases), 2nd group were given 500 mg ampicilline vial (15 cases), 3rd group were given 1 gm amoxicillin (15 cases). 30 patients received injectable antibiotics 30 minutes before the surgery started and 15 patients received oral antibiotics before 1 hour of surgery, to achieve high tissue concentration at the time of operation.

The maximum time for each procedure did not exceed 2 hours.

Meticulous handling of the tissues, avoidance of unnecessary surgical trauma and copious irrigation of the wound before closure were practiced during all surgical procedures to remove foreign bodies and debris in order not to leave potential foci for bacterial infections and perfect approximation of flap margins during closure of flap, those steps were of crucial importance in our measures to prevent post operative infection. All patients were examined in 2nd post-operative day to check the presence of any local and general signs of post operative infection (increased pain or tenderness and post operative swelling at the site of surgery, enlarged tender regional lymph node and fever), patients were also checked again in 7th post operative day (the time of suture removal) for the previous signs and for evaluation of healing degree through careful examination of union of the flap margins.

Then data were collected and analyzed with suitable statistical method.

The basis of evaluating post operative pain and edema:

Facial edema as well as the pain was evaluated on a visual analogue scale (VAS) of 0 to 100mm during the first week post-operative. We made a metric register of the edema, marking on the face of the patient the following points: mandibular angle, lateral cantus, base of the nasal wing, nasal commissures and pogonion on the side of the intervention. Taking the mandibular angle as a reference, we measured the distance between this point and the rest of the marks. Facial edema as well as the pain were evaluated after one day of operation on a visual analogue scale (VAS) of 0 to 100mm and after one week post-operatively and to be compared with

the same measurement before surgical intervention.

Results

No post operative infections were recorded in all 3 groups in our sample. Complications were recorded as follows; one patient, who was given ampicilline vial, had dry socket following 2 impaction procedures (13 %) of the cases.

perfect union of flap margins was seen in 10 patients of 1st group and 5 patients of 2nd group and 6 patients of 3rd group.

Discussion

Although some studies found that antibiotic prophylaxis in some oral surgical procedures is controversial ⁽⁸⁾ ⁽⁹⁾ ⁽¹⁰⁾, Its generally agreed that when antibiotic prophylaxis is decided, the antibiotic must be present in the systemic circulation at a high level at the time of surgery and is usually given as one dose ⁽⁹⁾ ⁽¹¹⁾ ⁽¹²⁾.

In spite of the fact that preoperative antibiotic prophylaxis is an established practice ⁽²⁾ ⁽¹⁰⁾, there is no consistent protocol for the method or duration of drug administration in oral surgical procedures ⁽¹⁴⁾, including Iraqi dental surgical centers.

In spite, ampicillin and gloxacilline are broad spectrum antibiotics, but penicillin is proved to be the 1st choice for aerobic bacteria which form the largest constituents of oropharyngeal flora ⁽¹⁰⁾, so administration of penicillin will reduce the chance of bacterial invasion to the wound more than other two antibiotics, which will lead to better healing process and consequent faster union of flap margins.

It is agreed that procedures entailing entry into the oropharynx or esophagus, need antibiotic coverage of

aerobic cocci is indicated ⁽⁸⁾. Prophylaxis has been shown to reduce the incidence of severe wound infection by approximately 50 percent ⁽¹⁵⁾ ⁽¹⁶⁾, either penicillin or cephalosporin-based prophylaxis is effective ⁽⁶⁾. Our choice in antibiotic selection depends on two factors

1. most of oral infections caused by penicillin sensitive bacteria ⁽⁴⁾
2. The use of penicillin is an established clinical practice in advanced surgical centers ⁽¹²⁾ ⁽¹³⁾

No post operative infections were recorded in our sample, for all patient groups (no difference between parenteral and oral route of administration). Complications were recorded as follows; one patient from 44 (she received 500mg ampicilline in two impaction surgical procedures) had dry socket.

We conclude that there is no difference in surgical prophylaxis between ampicilline (500mg), procaine penicillin (1 million i.u.), and Amoxicillin (1 gm) concerning post operative infection in out patient's oral surgical procedures.

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Figure (1) Histogram shows no. of patients according to gender

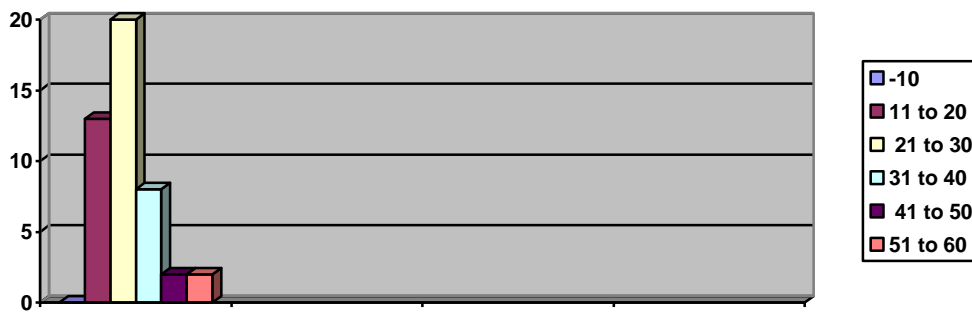


Figure (2) Histogram shows the No of patients according to age group



Figure (3) Histogram shows No of patients according to route of administration

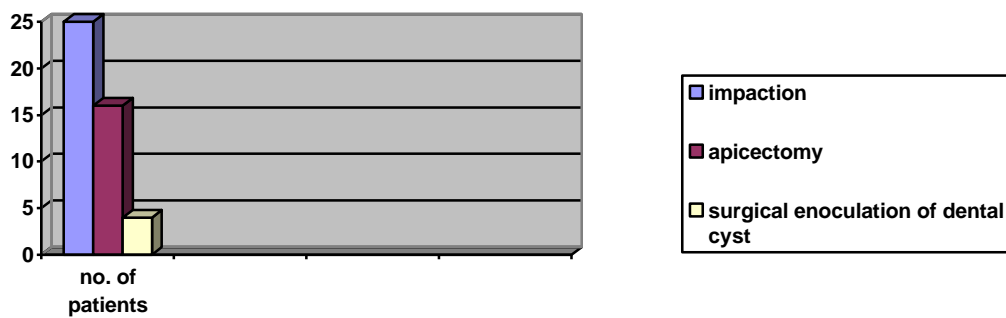


Figure (4) Histogram shows the no of various oral surgical procedures.