

Efficacy of a Short Course Antibiotic Prophylaxis for Open Reduction of Closed Fractures : First Report from India

Sir

The efficacy of prophylactic antibiotics in fracture surgery remains controversial for lack of well designed prospective studies. An evidence-based guideline, recently published by the surgical infection society, recommends immediate administration of short course of first generation cephalosporins as opposed to traditional approaches of prolonged course of antibiotics for open fractures.¹ We envisaged formulating an empiric antimicrobial policy for fracture surgery at a level I Trauma centre. We compared the prophylactic treatment of open reduction of closed fractures with three doses of intravenous cefazolin (the first dose was to be given 20 minutes before tourniquet inflation) as opposed to standard historical treatment of ten days of broad-spectrum antimicrobial. These guidelines were implemented after three months of the functioning of the centre. We assessed the efficacy of three doses of IV cefazolin for prophylaxis of open reduction of closed fractures during the first month of implementation of these guidelines against historical controls of similar surgeries performed during the initial three months.

A total of 50 closed fractures were treated by open reduction in one month (May, 2007). All the surgeries were conducted in ultra clean air operating rooms. The age of the patients ranged from 18-50 years, with a median of 30 years. Of these, open reduction and internal fixation (ORIF) was performed in 18 cases, interlocking in 13 cases, plating in 10 cases, tension band wiring (TBW) in 6 and screw fixation in 3 cases. Most of the (33, 66%) surgeries were performed under spinal anesthesia; 11(22%) were done under general anesthesia and 6 under epidural anesthesia. During the three months preceding implementation of the treatment guidelines, a total of 52 similar surgeries were performed (24 ORIF, 10 plating, 10 interlocking, 6 TBW and 2 screw fixation). The ages of these historical controls ranged from 15- 46 years, with a median of 38 years. The details of fractures in both groups are given in Table 1. Pre operatively and till two months post operatively, any evidence of infection was recorded by assessing the skin condition, presence of redness/ discharge/ wound gaping/ induration or increased local/ systemic temperature/, pain/tachycardia. It was observed that in both the

Table 1 : Type of fractures operated by open reduction in cases and historical controls

Type of fracture	Cases	Control
Both bone, forearm	10	9
Both bones leg	13	12
Bimalleolar	9	6
Trimalleolar	1	1
Medial malleolus	3	4
Lateral malleolus	2	4
Shaft of humerus	2	3
Tibia	2	3
Patella	3	3
Olecranon	3	3
Head of radius	2	2

groups, there was no evidence of local or systemic infection till the time of discharge and till three-month post operatively. This absence of postoperative infections in open reduction of closed fractures was due to proper surgical preparation, performance of surgeries in ultra clean air operating rooms and proper preparation of OT equipments. The three doses of parenteral dosing with cefazolin were sufficient to cover any perioperative contamination of the wound.

The choice of suitable antibiotics for prophylactic treatment should be based on the range of agents causing infections. Attention should primarily be paid, to Gram-positive bacteria, i.e., Staphylococci and Streptococci, which are the most common causes of infectious complications associated with fracture surgery.² Cephalosporins (such as cefazolin) are appropriate first line agents for most surgical procedures, targeting the most likely organisms while avoiding broad-spectrum antimicrobial therapy that may lead to the development of antimicrobial resistance. There are a number of studies, which substantiate the fact that a day's course is as effective as a seven day one.^{3,4} A shorter course of antibiotic reduces the cost, toxicity and chances of development of multi drug resistance. The present investigation was a single-center study. Larger, double blind controlled trials are needed in our set up to formulate the treatment/ prophylactic guidelines for open reduction of closed fractures.

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