

# Audit of prophylactic antibiotic use in orthopaedic surgery in Mulago Hospital

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## Abstract

**Background:** Prophylactic antibiotics are entrenched in implant orthopaedic surgery. We conducted a study to determine the use of prophylactic antibiotics in clean implant orthopaedic surgery in Mulago hospital.

**Methods:** We prospectively recruited patients undergoing ORIF, Athroplasty and Foot and Ankle surgery. We obtained information on antibiotic use and observed surgeries to determine the timing of administration.

**Results:** Antibiotics were not used in 17.3% of patients and over half

of the patients received the antibiotic after the skin incision had been made. The antibiotics were administered about 11 minutes from incision.

**Conclusion:** Majority of patients either did not receive antibiotics or received them after the skin incision had been made. The use of a third generation cephalosporin may be associated with increased complications and drug resistance. Antibiotic prophylaxis is in variance with literature and may result in adverse outcomes.

## Background

The risk of infection after Implant orthopaedic surgery has reduced because of the use of antibiotic prophylaxis and is hence established in practice(1). It is however known that compliance to the use and timing of antibiotics for prophylaxis is poor(2). Though the use and timing of antibiotics is well established, the compliance in the East African setting has not been documented. We conducted a study to determine the patterns of antibiotic prophylaxis in implant orthopaedic surgery in a large teaching hospital in East Africa.

## Methods

A prospective study was conducted in the orthopaedic unit of the Mulago Hospital between February and April 2011. Mulago hospital is the national referral hospital in Uganda and the teaching hospital for Makerere University School of Medicine. Patients undergoing implant orthopaedic surgery were included. We excluded patients with open fractures and patients undergoing implant surgery in the presence of infection. Data concerning the indications for surgery, procedure done and antibiotics used were obtained from the patient charts. The operative procedure was observed and the times of administration of antibiotics if any and skin incision were observed and recorded. Though the surgical team was not formally informed of the study, they were not blinded to

its conduct. The study was approved by the institution ethics board who waived the need for informed consent from the patients.

Data was collected by a questionnaire and entered into Epidata program and exported to SPSS v 11.5 (SPSS Inc., Chicago, Illinois).

## Results

We included a total of 52 patients of whom 35 were males with a mean age of 36 years (SD 15.53). The procedures done were 47 Open reduction and internal fixation, 4 athroplasties and 1 foot and ankle surgery (Table 1). In 43 patients (82.7%) prophylactic antibiotics were used. In the four cases where tourniquets were used (2 forearm, 1 tibia, 1 foot) the antibiotic was administered 10 minutes prior to tourniquet application. The only drug administered was intravenous ceftriaxone either as 1000, 1500 or 2000mg. The antibiotic was administered before the skin incision in only 20 of the 43 patients who receive antibiotics (46.5%) at an average of 11.3 minutes before incision (range 1-33).

In 23 patients (53.5%) the antibiotic was administered after the skin incision had been made at an average of 11.35 minutes after skin incision (range 1-26). In all cases the use of the antibiotic was initiated by the anaesthesia provider.

## Discussion

Our results show that over 17% of patients did not receive prophylactic antibiotics. It may be that these patients are at an increased risk for complications though it is unclear if these patients suffered worse outcomes. The use of antibiotics in orthopaedic trauma and arthroplasty is an established practice and this is supported by literature (3-7).

Less than half of patients received antibiotics prior to surgical incision. However in those receiving antibiotics prior to skin incision the timing was good averaging 11.3 minutes from incision time which is in line with recommendations that antibiotics should be administered as close as possible to incision time within the hour preceding surgery and that the timing of antibiotic administration is the most important factor in preventing infection(8-11).

Our study found that ceftriaxone, a third generation cephalosporin, was the only drug used in surgical prophylaxis. Though first generation cephalosporins are the recommended antibiotics for surgical prophylaxis in orthopaedics, the use of ceftriaxone in our setting may be due to its wide availability and the reduced cost of generic ceftriaxone in the local market (12). Cost is an issue to consider in the choice of antibiotic for surgical prophylaxis. A systematic review of literature found that a single dose of ceftriaxone may be a cost effective strategy(1).

Our study found that in all cases, the anaesthesia provider initiated the administration of antibiotics. Surgeons undertaking implant surgery should implement a mechanism to ensure that patients receive prophylactic antibiotics on time. Anaesthesia providers and all other surgical staff should also be involved in strategies to remedy the situation. The use of a simple surgical check list has been shown to increase compliance to timely antibiotic prescription and reduce the incidence of surgical site infections(2, 13). The rational use of antibiotics has been found that to result in decreased costs which would be a great motivation for many hospital managers (14). A weakness of the study is the fact that outcome data on infection was not retrieved mainly because of difficulties in follow-up. This study however, was aimed at comparing practices in the region in comparison to those established in literature.

## Conclusion

The prophylactic antibiotics use in Mulago Hospital is in

Procedure	Site	Number	Operations
Trauma	Femur	37	IM Nails
	Humerus	5	Plating
	Forearm	2	Plating
	Tibia	1	IM Nail
Foot and Ankle	Foot	1	K Wires
Arthroplasty	Hip Arthroplasty	4	Cemented Arthroplasty
	Procedure Not Recorded	2	
TOTAL		52	

variance with literature which may compromise results. Efforts should be made to ensure better compliance with accepted standards.

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