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Antibiotic Prescription Patterns in the Management of Open Fractures at Mulago Hospital in Kampala.

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Background: Open fractures are contaminated and may result in infection. The use of antibiotics has greatly reduced the risk of infection. We conducted a study in a large teaching hospital to evaluate the use of antibiotics in the management of open fractures.
Methods: A prospective study of adult patients with open fractures was conducted. Details of antibiotic use were extracted from the patient charts while details of the injury were determined by interviewing patients. Data was analysed using SPSS v 11.5.
Results: Majority of the patients were involved in road traffic accidents and were mainly pedestrians. Only about half of the patients had antibiotics started while in the accident and emergency department and only about half of the patients received tetanus toxoid prophylaxis.
Conclusion and Recommendations: The antibiotic prescription patterns are at variance with recommendations in literature. There is need to adopt hospital guidelines in the use of antibiotics and also the use of checklists to ensure patients receive all necessary medications before leaving the accident and emergency setting

Introduction

Open fractures are contaminated due to the break in the skin and exposure to the external environment. Their management involves debridement, wound closure, fracture stabilization, antibiotics and tetanus prophylaxis. Antibiotics are integral in the management of open fractures, without which the infection rate can be as high as 24%[1]. To reduce the risk of infection, antibiotics should be administered as soon as possible after injury[2]. We set out to determine the use of antibiotics in the management of open fractures in particular the timing of onset and antibiotic choice.

Patients and Methods

We conducted a prospective study of patients who were admitted through the emergency surgical ward for open fractures of the extremities. We excluded patients with isolated trauma to the head, chest abdomen and those who had burns. Trauma victims are usually received in the accident and emergency unit where after initial resuscitation they are taken to the emergency operating room for debridement and initial fracture stabilisation. They are then sent to the admitting parent ward from where the management continues till discharge. The patient records were used to retrieve details of injury, classification, use of antibiotics and operative procedures done. Patients were interviewed for details on the mechanism of injury. The study was approved by the hospital ethics board and all patients gave informed consent. Data was collected by a questionnaire and entered into Epidata program and exported to SPSS v 11.5 (SPSS Inc., Chicago, Illinois). Statistical tests used were the fisher's exact and chi square tests for categorical data and the t test for continuous data.

Results

We recruited 50 patients of whom 39(78%) were male and with a mean age of 32.18 years (SD 14.25). There was a high number of patients who rode motorcycles for a living and Road Traffic Crashes were the cause of injury in 48(96%) of patients with motorcycles dominating motorcars (Table1).

Majority of the patients involved in RTC's were pedestrians (Table 2). The only open fracture classification system used was the Gustilo and Anderson classification. The fractures were not classified in a large number of patients while grade 1 predominated in those in whom it was recorded (Table 3).

Table 1. Vehicles involved in Road Traffic Crashes

Vehicle Involved	Number	Percentage
Motorcar	21	43.8%
Motorcycle (Bodaboda)	25	52.1%
Unrecorded	2	4.2%
Total	48	100%

Table 2. Types of Road Users

Road User	Number	Percentage
Driver	3	6.3
Passengers	15	31.3
Cyclist	11	22.9
Pedestrian	18	37.5
Unrecorded	1	2.1
Total	48	100

Table 3. Gustilo and Anderson's Classification

Gustilo Classification	Number	Percentage
1	13	26
2	5	10
3a	7	14
3b	1	2
3c	0	0
Unrecorded	24	48
Total	50	100

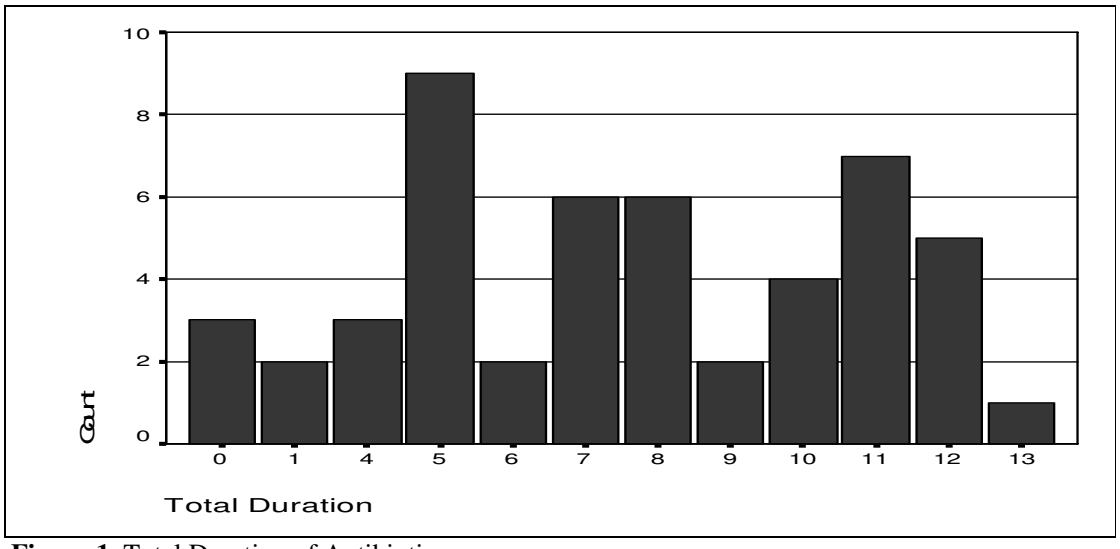

Figure 1. Total Duration of Antibiotics use

Table 4. Initial Antibiotic Given

Antibiotic Given	Number	Percentage
Ceftriaxone	22	44
Ampiclox	16	32
Cloxacillin	3	6
Ciprofloxacin	1	2
Others	5	10
Antibiotics not	3	6
Total	50	100

Only 27 (54%) patients were started on antibiotics in the accident and emergency department, 12 (24%) in the operating room and 8 (16%) in the postoperative recovery ward while 3 (6%) patients did not receive antibiotics at all. The commonest antibiotic given initially to patients was ceftriaxone (Table 4). In the 47 patients who received antibiotics, the duration of administration varied from one day to 13 days with an average of 7.3 days (SD 3.4) (Figure 1). There was no relationship between the Gustilo classification and the duration of use of antibiotics.

Tetanus toxoid was given in 34 (68%) patients with 16 (32%) not receiving tetanus prophylaxis.

Discussion

The majority of open fractures were sustained in road traffic crashes and most of the victims were pedestrians. The vulnerability of pedestrians has been previously been documented by Kigera and Naddumba[3] in Kampala. There is need to institute measures to mitigate this. First generation cephalosporins have been shown to be good in open fractures[4]. The choice of antibiotics in a public hospital may be influenced by a variety of factors including procurement. The use of third generation cephalosporin for prophylaxis is probably overkill. Open fractures have been traditionally been classified by the Gustilo and Anderson classification[5]. Other classification systems exist including the OTA classification[6,7]. That a majority of the injuries were not classified leads us to believe that the severity of the injury was probably not considered in the choice of antibiotics used. It is however known that the severity and level of contamination are prognostic factors and should be considered when choosing antibiotics[8].

There was wide variation in the duration of administration of antibiotics in this study. This variation was not related to severity of injury. It has been shown that a longer duration of antibiotics use doesn't mean better outcomes. Duration of three days is usually taken as the limit for the administration of antibiotics for prophylaxis in open fractures. This may be repeated for additional surgical procedures[8]. A hospital policy on the use of antibiotics may reduce cases of irrational drug use.

About a third of patients with open fractures did not get tetanus prophylaxis. This may be due to the hectic nature of the accident and emergency setting. Since the consequences of missing the tetanus prophylaxis is very grave the use of checklists before patients are transferred out of casualty may improve its administration. We conclude that the use of antibiotics is not in line with recommendations in literature. We recommend that there is need for a hospital antibiotics policy and the introduction of checklists for use in the accident and emergency department.

The limitations of this study are in the reliance on the patient records though this was necessitated by the need to assess the clinicians' usual practice which would undoubtedly have changed had they known a study was being carried out. There is also the possibility that some of the medication was given and not recorded in the charts.

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