CSIRO PUBLISHING

Healthcare Infection, 2015, **20**, 145–151
http://dx.doi.org/10.1071/HI15018

Compliance with international guidelines on antibiotic prophylaxis for elective surgeries at a tertiary-level hospital in the Philippines

Maria Isabel P. Nabor[1] MD

Brian S. Buckley[1,2,3] PhD

Marie Carmela M. Lapitan[1] MD

[1]Department of Surgery, Philippine General Hospital, Manila, Philippines.
[2]Institute of Applied Health Sciences, University of Aberdeen, Scotland.
[3]Corresponding author. Email: briansbuckley@gmail.com

Abstract. ***Background*:** Surgical site infections (SSIs) are a major cause of morbidity, associated with extended hospital stays, increasing costs and even death. Perioperative antibiotic prophylaxis has been proven to prevent SSIs. Guidelines have been published to promote best practice but studies continue to highlight poor compliance.

***Objective*:** This study aimed to assess adherence to antibiotic prophylaxis guidelines in common surgical operations in the teaching hospital of the national university in the Philippines.

***Methods*:** This was a medical records-based, cross-sectional study. Common surgical procedures included were breast surgery, enterostomy closure, open and laparoscopic colectomy, and open and laparoscopic cholecystectomy performed from December 2013 to March 2014. Data were extracted relating to patients' demographic characteristics, types of surgery, prophylactic antibiotic choice, route, dose, timing, redosing and duration of prophylaxis. Observed antibiotic prophylaxis was compared with guidelines.

***Results*:** Of the 244 cases that warranted prophylaxis, 93% were given antibiotics. Of these, 44% conformed with the guideline for type of antibiotic, 39% for dose, 100% for route, 45% for timing, 93% for redosing, and 67% for duration. Only 13% conformed to guidelines for all parameters of prophylaxis. Most cholecystectomies received Cefuroxime, no longer recommended by latest international guidelines. Of the laparoscopic surgeries, 38% received antibiotics earlier than the 1 hour before surgery recommended in latest guidelines.

***Conclusions*:** Ensuring surgeons fully follow guidelines on antibiotic prophylaxis remains a challenge, as highlighted by this study and others conducted around the world. Awareness-raising initiatives might be beneficial at institutional level to improve compliance with best practice guidelines.

Additional keywords: clinical guidelines, perioperative antibiotic prophylaxis.

Received 25 August 2015, accepted 5 October 2015, published online 28 October 2015

Research should be conducted that evaluates the effectiveness of such initiatives.Introduction

Surgical site infections (SSIs) are considered the most common nosocomial infections among surgical patients, with 2 to 5% of surgical patients affected. Establishing their prevalence with certainty is challenging because it varies between facility type and clinical populations, but surveys in the UK and USA have estimated that they account for 16% and 31% respectively of all healthcare-associated infections in inpatients. It is likely that the scale of the problem may be underestimated, since SSIs can occur after discharge. SSIs are a major cause of morbidity, associated with extended hospital stays and increasing costs.[1–3] It has been reported that patients who develop SSIs are up to 60% more likely to spend time in an intensive care unit, five times more likely to be readmitted to the hospital, and twice as likely to die than are patients without an SSI, and that one-third of postoperative deaths are related at least in part to SSIs.[4–8]

Perioperative antibiotic prophylaxis is effective in reducing the incidence of these infections by providing an adequate antibiotic agent present in the tissues during the whole time the incision is open and at risk of bacterial contamination. Optimal prophylaxis includes administering the right antibiotic, at the right dose, right time, right route and for the right duration. Excessive or unnecessary antibiotic use increases costs and promotes antimicrobial resistance.[4,7,9] Increasing antimicrobial resistance is a growing public health threat that implies increased reliance on more toxic and

Implications

- This study, and others from around the world, suggest that compliance with international guidelines on antibiotic prophylaxis in surgery is often poor.
- This has implications for both infection control and the rise of antibiotic resistance.
- Ensuring surgeons follow guidelines on antibiotic prophylaxis remains a challenge and it has been suggested that awareness-raising initiatives at institution level may be beneficial.

expensive second-line antibacterials. Reported proportions of resistant *Staphylococcus aureus* – the pathogen most common associated with SSIs – are higher than 20% globally, and exceeding 80% in some reports.[10]

International and national guidelines have been produced and disseminated relating to effective use of perioperative antibiotic prophylaxis. However, studies of compliance with guidelines have been published from many countries, with many finding that poor compliance is not uncommon.[11–22] Not all the studies have considered compliance with all the different but equally important aspects of prophylaxis, such as the proper antibiotic, dose, route, timing, redosing and duration of prophylaxis. This study aimed to assess compliance with current international guidelines on all these parameters of prophylaxis in representative elective surgeries conducted by the Department of Surgery at the Philippine General Hospital, the teaching hospital of the Philippines' national university.

Materials and methods

This study was a retrospective review of electronic medical records in the Integrated Surgical Information System (ISIS) at the Department of Surgery at Philippine General Hospital, a tertiary, government-funded teaching hospital in Manila, Philippines.

Study population

All consecutive cases logged in the Department of Surgery's Integrated Surgical Information System (ISIS) covering the period of December 2013 to March 2014 were assessed. The types of surgery included were those that were most common in each of the department's general surgery sections: surgical oncology, colorectal, hepatobiliary and pancreatic. Types of surgery included were elective breast surgery, closure of enterostomy, colectomy (open and laparoscopic), and cholecystectomy (open and laparoscopic), performed on adults (aged 18 and above) at the major operating rooms by the Department of Surgery performed from December 2013 to March 2014. Excluded from the study were: patients who underwent emergency operations, were included in research studies on antibiotics, who took antibiotics within 1 week of surgery, were diagnosed with infectious disease, with open fungating masses or infected lesions at the time of the surgery, and who had operations performed in combination with another procedure other than those mentioned above.

Data collection

All eligible cases were identified, and corresponding medical and operative records were reviewed and data collected using a standard data collection form. Demographic and clinical data included age, gender, surgical diagnosis, type of operation, estimated blood loss, start of anaesthesia, and time start and time end of the surgery. Data on the following aspects of surgical prophylaxis were collected: the antibiotic agent used, the route of administration, the dosage, the timing of administration, redosing, and duration of prophylaxis.

Adherence to international standards

In 2013, updated Clinical Practice Guidelines for Antimicrobial Prophylaxis in Surgery were published in the USA, developed jointly by the American Society of Health System Pharmacists, the Infectious Diseases Society of America, the Surgical Infection Society, and the Society for Healthcare Epidemiology of America (ASHP/IDSA/SIS/SHEA).[9] These new guidelines updated the previous 1999 ASHP guidelines in the light of research that was published subsequently. In the absence of up-to-date national or hospital-specific guidelines on perioperative antibiotic prophylaxis, surgeons at the Philippine General Hospital are expected to adhere to the American recommendations for best practice.

Compliance with the recommendations of the 2013 ASHP/IDSA/SIS/SHEA clinical practice guidelines was assessed for every parameter and overall compliance reported if all parameters were met. The latest recommendations for antibiotic prophylaxis in surgery are as follows, with antibiotics, dosage and timings summarised in Table 1.

(1) Antibiotic choice

The type of antibiotic prophylaxis depends on the type of operation. It should be spectrum-appropriate for the surgical site. Alternatives can be given for patients allergic to the first-line drug.

(2) Route

Antibiotic prophylaxis should be given intravenously.

(3) Dose

The recommended doses depend on antibiotic type. For Cefazolin, dose must be adjusted for patients exceeding 120 kg.

(4) Timing

All antibiotic prophylaxis for surgery must be given within 1 h before skin excision, except vancomycin, which requires a 1 to 2 h administration time so that the dose should begin within 120 min before the incision.

(5) Redosing

Giving a second dose is warranted for operations exceeding the half-life of the drug given. It is also needed for operations with a large amount of blood loss (>1500 mL).

(6) Duration