



The Brazilian Journal of INFECTIOUS DISEASES

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Review article

Adherence to guidelines for surgical antibiotic prophylaxis: a review



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ARTICLE INFO

Article history:

Received 23 February 2015

Accepted 22 June 2015

Available online 5 August 2015

Keywords:

Antibiotic prophylaxis

Antimicrobial prophylaxis

Guideline adherence

Surgical patient

ABSTRACT

Context and objectives: The appropriate use of antibiotic prophylaxis in the perioperative period may reduce the rate of infection in the surgical site. The purpose of this review was to evaluate adherence to guidelines for surgical antibiotic prophylaxis.

Methods: The present systematic review was performed according to the Cochrane Collaboration methodology. The databases selected for this review were: Medline (via PubMed), Scopus and Portal (BVS) with selection of articles published in the 2004–2014 period from the Lilacs and Cochrane databases.

Results: The search recovered 859 articles at the databases, with a total of 18 studies selected for synthesis. The outcomes of interest analyzed in the articles were as follows: appropriate indication of antibiotic prophylaxis (ranging from 70.3% to 95%), inappropriate indication (ranging from 2.3% to 100%), administration of antibiotic at the correct time (ranging from 12.73% to 100%), correct antibiotic choice (ranging from 22% to 95%), adequate discontinuation of antibiotic (ranging from 5.8% to 91.4%), and adequate antibiotic prophylaxis (ranging from 0.3% to 84.5%).

Conclusions: Significant variations were observed in all the outcomes assessed, and all the studies indicated a need for greater adherence to guidelines for surgical antibiotic prophylaxis.

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<http://dx.doi.org/10.1016/j.bjid.2015.06.004>

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Introduction

The World Health Organization (WHO) has developed, through an international consensus statement, a Surgical Safety Checklist aimed to improve the safety of patients undergoing surgical procedures, since safety measures are often not adequately implemented, even in referral centers.¹

The morbimortality associated to postoperative infections deserves special attention in patient care. Also, with the use of improper antibiotic prophylaxis patients are not adequately protected, may suffer adverse effects of these drugs, and more resistant strains can be selected.

Surgical infection remains an issue, being the third most frequent cause of nosocomial infection and affecting 14–16% of hospitalized patients. In surgical patients, postoperative wound infection is the most common cause of nosocomial infection, accounting for 77% of deaths. Patients who develop infection double the chance of dying compared to patients who undergo the same procedures without infection.² A nation-wide study conducted by the Brazilian Ministry of Health, in 1999, obtained a rate of surgical site infection (SSI) of 11% of the total surgical procedures assessed. This rate is more significant because of the factors related to the hospitalized population and the procedures carried out in health services.³

Antibiotic prophylaxis is aimed to reduce the incidence of SSI by preventing the development of infection caused by organisms that colonize or contaminate the surgical site. The main target of antibiotic prophylaxis is the wound. Antibiotics are administered to the patient to reduce the bacterial load, so that it does not overwhelm the host natural defenses, causing infection.⁴ The adequate use of perioperative antibiotic prophylaxis can reduce the rate of SSI in up to 50%.¹

Efforts have been undertaken to establish guidelines for the appropriate use of antibiotic prophylaxis. These guidelines are designed to provide professionals with a standardized approach to rational, safe and effective use of antimicrobial agents for the prevention of SSI, and their content is based on current available clinical evidence, besides emerging issues.⁵

Although the principles of antimicrobial prophylaxis in surgery are clearly established and several guidelines have been published, the implementation of these guidelines has been impaired by multiple factors.⁶ Some possible reasons include the difficulty encountered by professionals to update their knowledge, their dependence on habits originated in clinical practice rather than in evidence, the lack of policies, and failures in the implementation of norms and institutional guidelines.⁷

In view of the aforementioned, the present review aimed to assess the adherence to guidelines for surgical antibiotic prophylaxis, by analyzing studies on the application of local, national and/or international guidelines.

Material and methods

The present Systematic Review was developed according to the methodology recommended by the Brazilian Cochrane Collaboration center and was approved by the Research

Ethics Committee of Hospital Universitário Gaffrée and Guinle/UNIRIO.

The review included the articles published from July 2004 to July 2014, based on the following databases: Medline (via PubMed), Scopus and Portal da BVS (with selection of Lilacs and Cochrane databases). The search strategies were designed according to the specificity of each database, considering three main research indexes: title, abstract, and subject for Scopus and Lilacs, and title and topic for Pubmed. Whenever possible, the strategies were elaborated with the controlled vocabulary subject descriptors of Mesh/Medline and DeCs/BVS. Besides, free text terms searched in the main periodicals, as well as in references, abstracts and comments of related articles were used to increase the sensitivity of the search. The search was combined with Boolean operators “OR” for addition and “AND” for the list of terms. No idiom filters were applied.

The terms used in the search were translated into controlled vocabulary according to the research variables and the following representation of subject and free text terms was observed: *Antibiotic prophylaxis, prophylactic antibiotic, antimicrobial prophylaxis, prophylaxis, surgery, surgical patient, surgical wound infection, postoperative wound infection, surgical procedure, operative, operative surgical procedure, guideline adherence, evaluation, adherence, surveillance, appropriate, appropriateness.*

1. Inclusion criteria for selection of articles were:

- Population: studies in patients aged 18 or over;
- Articles portraying themes related to adherence to guidelines for surgical antibiotic prophylaxis;
- Studies on surgical procedures on the following specialties: gynecology, urology, vascular surgery, otorhinolaryngology, neurosurgery, thoracic surgery, general surgery, plastic surgery.

2. Exclusion criteria for selection of articles were:

- Articles whose main purpose was to correlate antibiotic prophylaxis to the occurrence of SSI;
- Articles exclusively or mostly on:
 - Pediatric patients;
 - Emergency procedures and/or trauma;
 - Endoscopic exams;
 - Surgical procedures of the following specialties: cardiac surgery, orthopedics, odontology, oral and maxillofacial surgery, dermatology, ophthalmology and obstetrics.

The outcomes assessed in the 18 selected studies were as follows: (1) appropriate indication of antibiotic prophylaxis; (2) inappropriate indication of antibiotic prophylaxis; (3) antibiotic administration at the correct time; (4) correct antibiotic choice; (5) adequate discontinuation of antibiotic; and (6) adequate antibiotic prophylaxis.

The outcomes of interest analyzed in the articles were considered appropriate or not, according to the observance of predefined parameters of antibiotic prophylaxis protocols/guidelines adopted in each article. The antibiotic prophylaxis was considered adequate when there was adherence to the criteria established in the guidelines adopted in each study.

Each article was assessed by two independent reviewers and all data were extracted by these reviewers. Details on

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