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Review Article

Surgical site infection: risk factors

Patricia S. E. Riojas*

School of Medicine, University of Monterrey, Monterrey, Nuevo León, México

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***Correspondence:**
Dr. Patricia S. E. Riojas,
E-mail: patty.er94@gmail.com

ABSTRACT

Surgical site infections are some of the most common and costly health care-associated infections. We searched PubMed for articles that talk about surgical site infection, to analyze the information contained in them and synthesize it in the present text. It is estimated that surgical site infections are developed 2 to 5% of patients undergoing surgical procedures per year. They are directly associated with an increase in morbidity and mortality, in fact, they are the leading cause of death in the immediate postoperative period. It is observed in the literature that only 4 measures are recommended by all agencies and institutions: proper hair removal, antibiotic prophylaxis, preparation of the surgical field with alcohol-based product, being recommended in the Most of them are alcoholic chlorhexidine and normothermia. In addition to the measures recommended by international mechanisms, it is essential to control risk factors as much as possible to minimize the possibility of surgical site infection, as well as to follow asepsis and antisepsis measures, as well as proper management. of the surgical wound.

Keywords: Surgical wound, Risk factors, Infections

INTRODUCTION

Surgical site infections are some of the most common and costly health care–associated infections, they are defined as that which appears at the site of the surgical wound or near it, at least 30 days after the operation or after 90 days if there is implantation of prosthetic material.[1,2]

The search for strategies to reduce operative site infection is essential, due to its direct relationship with the outcome of postoperative patients. At present it is considered a major public health problem with great clinical and epidemiological importance, since it affects both the family and state economy, generating higher treatment costs by prolonging hospital stays, causing long-term disability and greater resistance of microorganisms to antimicrobials, as well as unnecessary and preventable deaths.

The objective of this bibliographic review is to mention the risk factors for the development of this disease and, based on the data found, to make the necessary recommendations for its prevention.

METHODS

We searched PubMed for articles that talk about surgical site infection, to analyze the information contained in them and synthesize it in the present text.

THEORETICAL FRAMEWORK

It is estimated that surgical site infections are developed 2 to 5% of patients undergoing surgical procedures per year.

They are directly associated with an increase in morbidity and mortality, in fact, they are the leading cause of death in the immediate postoperative period.[3]

Surgical site infections can be divided depending on the layer of tissue involved in superficial, deep, and organs. Since 1992 the centers for disease control and prevention (CDC) in Atlanta together with the epidemiological hospital society of America and the society of surgical infections created a division, each with specific diagnostic criteria.[3]

Superficial incisional infection involves from the epidermis to the subcutaneous cellular tissue. The patient may have purulent drainage with or without laboratory confirmation from the superficial incision, microorganisms isolated from a culture or some sign of infection such as pain, swelling, redness and heat.[3]

The deep wound involves fascia or muscle related to the incision and the patient presents a purulent drainage of the incision but not of the organ/space, there may be spontaneous dehiscence of the incision or incision opened by a surgeon when there is any of the following signs or symptoms: fever >38ºC, localized pain or swelling. It may include deep wound an abscess or other evidence found during direct examination, during recovery, or by histopathological or radiological confirmation.[3]

The anatomical organ/space wound which involves any part of the anatomy (organ, space) other than the incision, which has been opened or manipulated during an operation that produces purulent drainage from drainage left in the organ/space, or that has recovered an organism by culture or an abscess or other evidence of infection involving the organ or space during direct examination, by histopathological examination or radiological evaluation.[3]

RISK FACTORS

Chronic diseases

Chronic diseases have been found to weaken the immune system of patients. For example, in diabetes mellitus (DM), the blood becomes viscous producing a decrease in the effectiveness of immune cells to reach the required sites such as surgical sites where external bacteria have penetrated.[2-5]

Aging

The nervous and vascular contribution of the skin decreases with respect to the advance of the age of the person, these physiological changes predispose to a slowing or poor healing of wounds in older adults.[2-5]

Smoking

Smoking is associated with major adverse effects after surgery, including surgical site infection and pulmonary complications. The harmful effect of smoking on wound healing is multifactorial, with mechanisms including vasoconstriction leading to relative ischemia of operated tissues, a decrease in the inflammatory response and alterations in collagen metabolism.[2-5]

Use of corticosteroid treatment

Immunosuppression at the systemic level is a risk factor for healing of delayed skin, particularly in clinical situations where organ transplantation and malignancy are involved.[2-5]

Malnutrition

Proper nutrition is imperative for the prevention of infection, which has deleterious effects on wound healing.[2-5]

Use of prosthetic materials

There are different types of surgeries, especially orthopedic ones, which often involve the placement of a foreign body, such as a prosthetic joint, joint components or others to stabilize bone structures or repair fractures. Orthopedic implants can facilitate infection either by direct contamination of the device or by hematogenous spread of microorganisms. Direct contamination occurs during the presurgical period, hematogenous contamination occurs after this period and is associated with primary bacteremia or infection of a site distant from surgery. Secondary bacteremia, from a site far from surgery, produces microbiological seeding in the prosthetic device or in the surrounding tissue. The bacterial colonization of the prosthetic material includes from skin flora of low virulence to microorganisms of high in-hospital resistance.[2-5]

Time of surgery

The duration of surgery is directly linked to the occurrence of infection, a surgical time greater than 120 min is a risk factor for the occurrence of infection. A longer time in surgery means a longer time of exposure of the tissues to the operating room environment, coupled with the fatigue of the equipment which can be related to carelessness in aseptic techniques leading to technical failures and decreasing the systemic defenses of the organism.[2-5]

Pre- and post-hospital stay

Hospitalization, whether pre or post hospital prolonged: greater than 24 hours, allows microorganisms from the hospital center (therefore more resistant) to colonize patients, with greater risk in post-operatives, since the surgical wound is a disruption of the skin barrier facilitating the entry of pathogens.[2-5]

Degree of contamination

The risk of infection increases proportionally with the degree of contamination of the wound.[2-5]

DISCUSSION

It is observed in the literature that only 4 measures are recommended by all agencies and institutions: proper hair removal, antibiotic prophylaxis, preparation of the surgical field with alcohol-based product, being recommended in the most of them are alcoholic chlorhexidine and normothermia.[1-9] In addition, the majority agrees in not recommend measures such as plastic incision fields, or antibiotics in sutures, specifically the last is recommended in isolation in some guides, although with very limited evidence, while screening of *Staphylococcus aureus*, for example, remains a controversial practice. In this sense, some guides recommend that perform screening for methicillin-resistant *S. aureus* (MRSA), others simply from the germ *S. aureus* and others not even screening is recommended due to lack of evidence.[1-9]

CONCLUSION

In addition to the measures recommended by international mechanisms, it is essential to control risk factors as much as possible to minimize the possibility of surgical site infection, as well as to follow asepsis and antisepsis measures, as well as proper management. of the surgical wound.

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