Research Article
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Microorganisms associated with surgical site infections and orthopedic devices at the orthopedic spine service, orthopedics hospital

Summary

Knowing the microorganisms associated with surgical site infections and orthopedic devices in the Orthopedic Spine Service, Dr. Victorio de la Fuente Narvaez Magdalena de las Salinas Orthopedic Hospital, not only confirm the diagnosis, but also allow a specific treatment once known the sensitivity of the microorganism obtained. These infections have diverse etiologies that depend, in part, on different epidemiological contexts. In a period from November 2016 to June 2017, all the positive results of surgical wound cultures sent to the bacteriology laboratory of the hospital unit were reviewed, taken from patients in hospital with surgical site infection and device-associated infection Orthopedic. Results were positive for microorganisms in 24 cultures of which 34 microbiological isolates were obtained, of which 18 (52%) represent gram positive and 16 (48%) gram negative. Staphylococcus coagulase-negative *staphylococci* were the most common 9 cultures (26%), followed by *Staphylococcus aureus* with 5 cultures (14%), *Enterococcus* in 4 cultures (11%), 2 *E. faecium* and 2 *E. Faecalis*. *Escherichia coli* was the most present in seven cultures, *Proteus Mirabilis* in 1, *Klebsiella pneumoniae* in 1, *Klebsiella oxytoca* in 1. Other microorganisms such as *Pseudomonas Aeruginosa* in 2 cultures (5%) and *Acinetobacter baumannii* in 2 cultures (5%).[1]

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Introduction

Knowing the local epidemiology allows a specific treatment, once the sensitivity of the microorganism isolated in surgical site infections and in those associated with orthopedic devices is known. Human beings are surrounded by a series of microorganisms, most of which are completely harmless and some are even beneficial and necessary for our existence. Sometimes, however, our interaction with microbes can lead to an infection, which is the result of an interaction between a host (the patient) and a microorganism or some of its products.[2]

In general, at least four factors determine whether an infection will occur, some related to microbes and some related to the host. Important microbial factors include the number of microorganisms present; secondly, the particular armament of the virulence factors; Third, the most critical factor that the host contributes to the interaction is the immunological state. Finally, for an infection to occur, the microorganism or its products must come into contact with the host.[3]

The role of infection control programs has grown and continues to grow as the rates of antimicrobial resistance increase and orthopedic-associated infections lead to increased risks for patients and the expansion of the costs of treatment medical care.[4]

Antimicrobial selection is based on cost, safety profile, ease of administration, pharmacokinetic profile and bactericidal activity, since antimicrobials are expensive and should not be used unnecessarily, and microbial resistances are produced due to their unjustified use.[5]

Antimicrobial resistance is a worldwide problem. The irrational use of antibiotics is the main determinant in the development of resistance, so the determination of the causative agent not only confirms the diagnosis, but also allows a specific treatment once the sensitivity of the isolated microorganism is known.[6]

Methods

In a period from November 2016 to June 2017, all positive results of surgical wound cultures sent to the bacteriology laboratory of the hospital unit, taken from hospitalized patients and outpatients with clinical or surgical diagnosis of surgical site infection were reviewed and of infection associated with orthopedic devices.

Results

Positive results were obtained for microorganisms in 24 cultures of which 34 microbiological isolates were obtained, of these 18 (52%) represent gram positive and 16 (48%) gram negative. Of the gram positive, negative coagulase Staphylococcus were the most frequent in 9 cultures (26%) (Figure 1). We know that these are the pathogens associated with the progress of medical technology and that they can be harmless commensals or invasive pathogens. The important thing is to notice the difference. Infections are typically indolent, with long latency periods between the time of contamination of the biomedical device and the manifestation of the disease. It is worth mentioning that oxacillin resistance was shown in all 9 crops. Followed by Staphylococcus aureus in 5 cultures (14%) showing all sensitivity in the antibiogram to methicillin, Enterococcus in 4 cultures (11%), 2 are *E. faecium* and 2 are *E. faecalis*. In the gram negative (Figure 2) the enterobacteria are the most frequent, representing 10 cultures (29%), of these Escherichia coli was the most frequent in 7 cultures, Proteus Mirabilis in 1, Klebsiella pneumoniae in 1, Klebsiella oxytoca in 1. Other microorganisms such as Pseudomonas aeruginosa in 2 cultures (5%) and Acinetobacter baumannii in 2 cultures (5%).

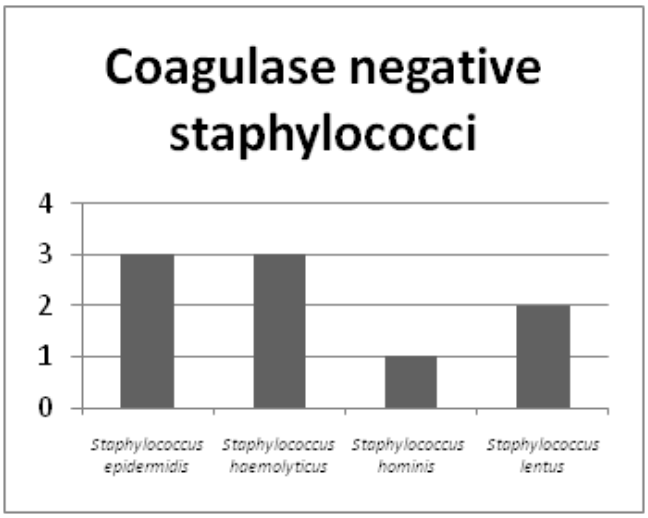

Figure 1

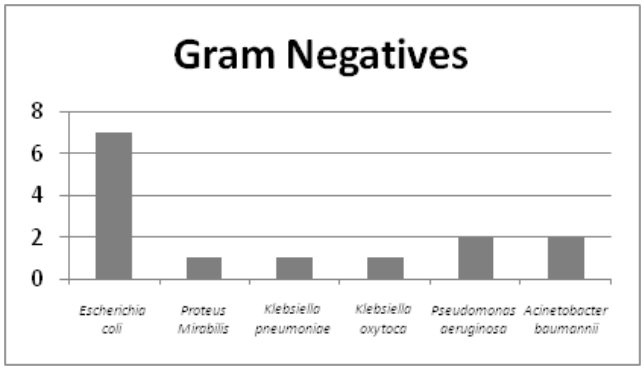

Figure 2

Discussion

Understanding that the specific microbiology of an infection associated with orthopedic devices (IADO) or infection associated with a surgical site affects the severity, the form of onset and the prognosis of the infection. We found congruence with the international literature in that the majority of IADOs are associated with gram positive microorganisms that are part of the normal biota of the skin, including Staphylococcus coagulase negative and Staphylococcus aureus. But other microorganisms such as Enterococcus and gram-negative bacilli, including Pseudomonas aeruginosa, Entrobacter spp., And Klebsiella spp., are also frequent isolates of orthopedic infections.

Currently the surgical environment is challenged by new pathogens or known microorganisms with complicated resistance patterns. All health staff members must understand the impact of IADOs and must implement evidence-based preventive strategies to reduce the incidence of these infections. Interventions to prevent surgical site infections should be incorporated into infection prevention policies and protocols, staff should monitor adherence to these and monitor the results.

Conclusion

Knowing the local epidemiology allows a specific treatment once the sensitivity of the microorganism obtained in surgical site infections and orthopedic devices is known. Priority should be given to the essential components of prevention, which include focusing on patient care with committed and busy leadership, teamwork and communication. Communication tools and the use of instruments such as checklists that identify critical characteristics during the surgical procedure and "time out" before the surgical incision that includes verifying the administration of adequate prophylactic antibiotics in a timely manner and the instructions for sterilization, are examples of communication strategies associated with reduction of infections associated with surgical site.

Acknowledgments

None

Conflicts of interest

The authors declare that they have no conflicts of interest in this work.

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