ARCH SOC ESP OFTALMOL. 2017;xxx(xx):xxx–xxx

ARCHIVOS DE LA SOCIEDAD ESPAÑOLA DE OFTALMOLOGÍA

www.elsevier.es/oftalmologia

Original article

Clinical features and microbiological in bacterial keratitis in a tertiary referral hospital☆,☆☆

J.M. Ruiz Caro[a,*], *L. Cabrejas*[a], *M.R. de Hoz*[b], *D. Mingo*[a], *S.P. Duran*[a]

[a] *Departamento de Oftalmología, Hospital Universitario Fundación Jiménez Díaz, Madrid, Spain*
[b] *Instituto de Investigación Ramón Castroviejo, Madrid, Spain*

ARTICLE INFO

Article history:
Received 20 September 2016
Accepted 11 January 2017
Available online xxx

Keywords:
Antibiotic resistance
Bacterial keratitis
Clinical features

ABSTRACT

Objective: To describe the clinical features, bacterial agents, and antibiotic sensitivity of bacterial keratitis in the Ophthalmology Department at the University Hospital Fundación Jiménez Díaz (HUFJD) in Madrid.

Materials and methods: A retrospective observational descriptive study using clinical records and reports of corneal scrapings in patients with bacterial keratitis at the HUFJD conducted between 2009 and 2014.

Results: In a sample of 160 patients, gram-positive bacteria were the most prevalent with 64.3% (n = 103). Coagulase negative *Staphylococcus* (20.6%), *Staphylococcus aureus* (19.4%), and *Pseudomonas aeruginosa* (12.5%) were the most frequent bacteria. The most common risk factor was the use of contact lenses, followed by disease of the ocular surface, and previous ocular surgeries. The antibiotics to which the bacteria were most commonly susceptible were gentamicin (n = 114), cotrimoxazole (n = 107), vancomycin (n = 106), and ciprofloxacin (n = 97). The antibiotics to which the bacteria were most commonly resistant were ampicillin (n = 59) and erythromycin (n = 45).

Conclusions: In the initial management of bacterial keratitis, the sensitivity and resistance of bacteria to antibiotics should be taken into account. Based on our findings, the use of aminoglycosides, vancomycin and fluoroquinolones is recommended, and, although widely used today, the discontinuation of erythromycin.

☆ Please cite this article as: Ruiz Caro JM, Cabrejas L, de Hoz MR, Mingo D, Duran SP. Características clínicas y microbiológicas en queratitis infecciosas bacterianas en un hospital de tercer nivel. Arch Soc Esp Oftalmol. 2017. http://dx.doi.org/10.1016/j.oftal.2017.01.004

☆☆ Presented as a paper of the Master in Health Sciences Research.

* *Corresponding author.*
E-mail address: drivertad@hotmail.com (J.M. Ruiz Caro).

Características clínicas y microbiológicas en queratitis infecciosas bacterianas en un hospital de tercer nivel

Palabras clave:
Resistencia antibiótica
Queratitis bacteriana
Características clínicas

RESUMEN

Objetivo: Describir las características clínicas, agentes bacterianos y sensibilidad antibiótica de las queratitis bacterianas en el Servicio de Oftalmología del Hospital Universitario Fundación Jiménez Díaz (HUFJD) de Madrid.

Materiales y métodos: Estudio observacional, descriptivo y retrospectivo de los registros clínicos e informes de los raspados corneales en pacientes con queratitis bacterianas en el HUFJD realizados entre los años 2009 y 2014.

Resultados: Se tuvo una muestra de 160 pacientes. Las bacterias grampositivas fueron las más prevalentes con un 64,3% (n = 103). *Staphylococcus* coagulasa negativo (20,6%), *Staphylococcus aureus* (19,4%) y *Pseudomonas aeruginosa* (12,5%) fueron las bacterias más frecuentes. El factor de riesgo más común fue el uso de lentes de contacto, seguido de enfermedad de la superficie ocular y cirugías oculares previas.

Los antibióticos a los que las bacterias fueron más comúnmente sensibles fueron: gentamicina (n = 114), cotrimoxazol (n = 107), vancomicina (n = 106) y ciprofloxacina (n = 97) y los antibióticos a los que las bacterias fueron más comúnmente resistentes fueron ampicilina (n = 59) y eritromicina (n = 45).

Conclusiones: En el manejo inicial de las queratitis bacterianas se debería tener en cuenta la sensibilidad y resistencia de las bacterias ante los antibióticos. Recomendamos, con base en nuestros hallazgos, el uso de aminoglucósidos, vancomicina y fluoroquinolonas, e interrumpir el uso de eritromicina, que es ampliamente usada actualmente.

Introduction

Infectious keratitis is one of the main causes of blindness throughout the world.[1,2] It can be caused by the proliferation of bacteria, fungi, virus and parasites, and can associate to inflammation as well as tissue destruction.[3,4] The incidence of infectious keratitis in the USA is 28 per 100,000 inhabitants/year.[5] In Spain, there are no exact incidence numbers.

The most common microorganisms that cause said disease include strains of *Staphylococcus, Streptococcus* and *Pseudomonas aeruginosa*, as well as gram-negative enteric bacteria.[2,3,6–8] It must be taken into account that bacterial keratitis is the most frequent suppurative corneal ulcer.[9] It can exhibit symptoms such as pain, foreign body feeling, redeye, photophobia, tearing and secretion[10] and its risk factors include contact lens use, ocular trauma, previous ocular surgery (including laser assisted in situ keratomileusis or Lasik), ocular surface diseases (dry eye syndrome, blepharitis, entropion, corneal exposure and anesthesia), previous herpetic or bacterial keratitis as well as local or systemic immunosuppression, diabetes and vitamin A deficiency.[2,3,11,12] Laboratory studies on infectious keratitis include corneal scraping for Gram staining and cultures to isolate the causing microorganism and determine antibiotic susceptibility.[13–17] The sensitivity test is performed to determine the most effective available antimicrobial. Broad range topical antibiotic therapy is applied initially[18] – and modified if necessary – on the basis of clinical response, severity, risk of perforation, culture results and antimicrobial sensitivity.[19–21] It is important to emphasize sample taking and culture of patients with infectious keratitis, because this is crucial in the management, follow-up and evolution of the condition.[17,22–25]

Bacterial keratitis is a frequently diagnosed and treated disease in hospital environments, that can produce severe corneal alterations with loss of transparency and diminished visual acuity. The present study aims at describing the epidemiological pattern, the risk factors, symptomatology and antibiotic susceptibility in bacteria infectious keratitis at the Ophthalmology Department of the Fundación Jiménez Díaz University Hospital between 2009 and 2014, in order to contribute to the knowledge and management of this frequent disease.

Subjects, material and methods

A descriptive, observational and retrospective study based on the review of clinical records of patients with a diagnostic of bacterial keratitis between 2009 and 2014 at the Ophthalmology and Ocular Emergency Department of the Fundación Jiménez Díaz University Hospital (HUFJD) (Madrid, Spain). The sample was obtained on the basis of the main inclusion criteria, i.e. all patients with positive culture who had the antibiotic susceptibility analysis, excluding patients with polymicrobial infectious keratitis, those with possible contamination report and with non-bacterial infectious keratitis.

The approval and authorization of the HUFJD Ethics Committee was requested for managing clinic as well as laboratory data. The Helsinki declaration rules were adhered to, obtaining data from clinic records and lab reports of