

Severe bacterial corneal abscesses in children

Lyz Sarah Bel'hantier *, Ghizlane. Daghouj, Loubna El Maaloum Bouchra Allali and Asmaa El Kettani

Department of pediatric ophthalmology, Hospital 20 August 1953, University Center Hospital Ibn Rochd, Casablanca, Morocco.

World Journal of Advanced Research and Reviews, 2024, 22(03), 2179–2182

Publication history: Received on 11 May 2024; revised on 26 June 2024; accepted on 29 June 2024

Article DOI: <https://doi.org/10.30574/wjarr.2024.22.3.1898>

Abstract

Introduction: Corneal abscess is a severe condition with a guarded prognosis and potential for blindness. Diagnosis relies on clinical evaluation, necessitating prompt and appropriate management to prevent delays in diagnosis and therapy that could adversely affect visual outcomes. The objective of our study is to characterize the epidemiological, microbiological, clinical, therapeutic, and prognostic aspects of corneal abscesses in pediatric patients.

Material and methods: We conducted a retrospective study that included all cases of confirmed bacterial corneal abscesses in hospitalized children over a 2-year period. Each child underwent corneal scraping with microbiological examination, and data were collected from their medical record

Results: The total number of cases was 18 patients with 18 eyes, with an average age of 3 years and a male predominance. Pain and ocular redness were the main functional signs. Visual acuity was difficult to assess due to the young age of the patients. The pathogens identified were gram-positive bacteria in 55.5% of cases, gram-negative bacteria in 33.5%, and polymicrobial in 11%. Contributing factors included ocular trauma, history of ocular surgery, ocular dryness, and ocular rosacea. Initial treatment consisted of broad-spectrum antibiotic therapy with fortified ceftazidime and vancomycin eye drops combined with systemic antibiotics. Treatment was subsequently adjusted based on microbiological results and clinical progression. An antifungal agent was added for suspected superinfected fungal keratitis, using voriconazole eye drops. An antiviral was added for suspected superinfected herpetic keratitis, with oral acyclovir. The average duration of treatment was 3 weeks. In 66.5% of cases, the outcome was favorable with improved visual acuity and reduced corneal opacity.

Discussion: The risk factors for corneal abscess are primarily ocular trauma in developing countries and contact lens wear in developed countries. In our series, the most significant risk factors were ocular trauma and a history of ocular surgery. The frequency of pathogens responsible for corneal abscess varies from region to region and depends on geographical location and climate. Consistent with the literature, in our series, the most common pathogens were gram-positive bacilli (55.5%). Initial treatment should be broad-spectrum targeting both gram-negative and gram-positive bacteria, and subsequently adjusted based on microbiological results. This approach aims to achieve optimal therapeutic efficacy and improve clinical outcomes

Conclusion: The corneal abscess is a serious infection that affects visual prognosis. Faced with a severe corneal abscess, only rapid and well-conducted diagnostic and therapeutic management can reduce the risk of an unfavorable outcome. Similarly, prevention involves better management of ocular trauma and other causal factors.

Keywords: Corneal Abscess; Bacterial Origin; Children; Pathogens; Antibiotic Therapy

* Corresponding author: Lyz Sarah Bel'hantier

1. Introduction

The corneal abscess is a serious condition characterized by a typically guarded prognosis and a potential risk of blindness. Diagnosis relies heavily on meticulous clinical evaluation, underscoring the critical need for prompt and appropriate management to avoid delays that could adversely impact both diagnosis and treatment, and consequently, the patient's visual outcome [1]. Our study aims to comprehensively analyze the epidemiological, microbiological, clinical, therapeutic, and prognostic aspects of corneal abscesses in pediatric patients. Specifically, we seek to identify predisposing risk factors such as a history of ocular trauma or surgery, and commonly implicated pathogens including gram-positive and gram-negative bacteria. We will also explore initial therapeutic strategies and their adaptation based on microbiological findings, aiming to enhance not only healing rates but also long-term functional and visual outcomes in these young patients.

2. Material and methods

We conducted a retrospective study over a 2-year period, encompassing all cases of confirmed bacterial corneal abscesses in hospitalized children. Each child included in the study underwent corneal scraping for detailed microbiological examination. Data were meticulously collected from their medical records, encompassing medical history, clinical symptoms at admission, microbiological analysis results, as well as therapeutic strategies and short- and long-term clinical and visual outcomes. This approach allows us to comprehensively analyze the epidemiological and microbiological characteristics of corneal abscesses in children, while evaluating the effectiveness of current treatments and identifying prognostic factors influencing disease progression.

3. Results

The total number of cases was 18 patients with 18 eyes, with an average age of 3 years and a male predominance. Average consultation time was 5 days. Pain and ocular redness were the main functional signs. Visual acuity was difficult to assess due to the young age of the patients. The pathogens identified were gram-positive bacteria in 55.5% of cases, gram-negative bacteria in 33.5%, and polymicrobial in 11% (Table 1).

Table 1 Germs found

Germs	Number	Percentage
Gram positive bacteria	10	55.5%
Staphylococcus	7	
Streptococcus	3	
Gram negative bacteria	6	33.5%
Pseudomonas	4	
Escherichia Coli	2	
Multimicrobial	2	11%

Contributing factors included ocular trauma, history of ocular surgery, ocular dryness, and ocular rosacea (Figure 1)

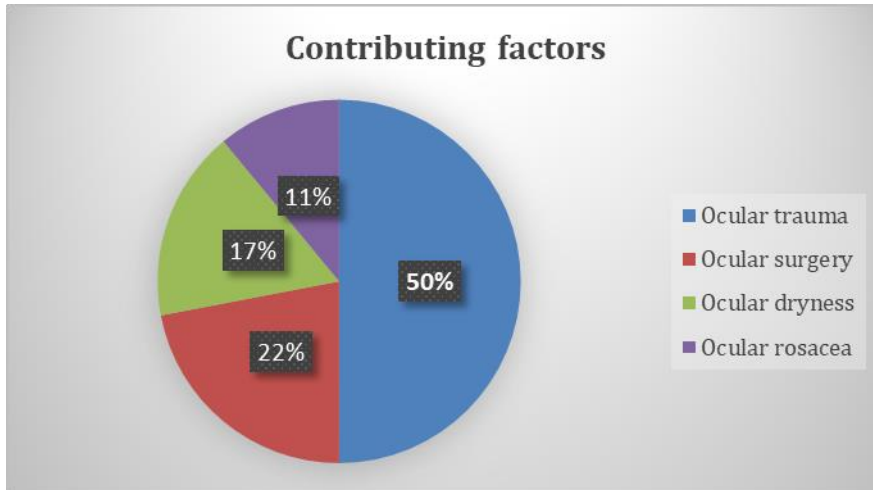


Figure 1 Contributing factors



Figure 2 Abscess on eye operated for corneal wound 6 months ago

Initial treatment consisted of broad-spectrum antibiotic therapy with fortified ceftazidime and vancomycin eye drops combined with systemic antibiotics. Treatment was subsequently adjusted based on microbiological results and clinical progression. An antifungal agent was added for suspected superinfected fungal keratitis, using voriconazole eye drops. An antiviral was added for suspected superinfected herpetic keratitis, with oral acyclovir.

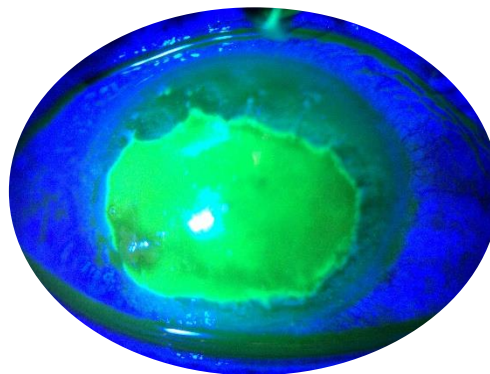


Figure 3 Superinfected herpetic keratitis

The average duration of treatment was 3 weeks. In 66.5% of cases, the outcome was favorable with improved visual acuity and reduced corneal opacity

Discussion: The risk factors for corneal abscess vary globally, with ocular trauma being predominant in developing countries and contact lens wear playing a significant role in developed countries [2]. In our study, the most prominent

risk factors identified were ocular trauma and a history of ocular surgery. The spectrum of pathogens causing corneal abscesses varies according to geographical location and climate [3]. Consistent with the literature, gram-positive bacilli were the most common pathogens found in our series, accounting for 55.5% of cases. Effective management begins with broad-spectrum initial treatment targeting both gram-negative and gram-positive bacteria. This approach is crucial in the early stages and allows for subsequent adjustments based on microbiological findings [4,5]. The goal is to optimize therapeutic outcomes by promptly addressing the likely pathogens, thereby reducing the risk of complications and improving overall clinical prognosis in patients with corneal abscess [6].

4. Conclusion

The corneal abscess is a serious infection that affects visual prognosis. Faced with a severe corneal abscess, only rapid and well-conducted diagnostic and therapeutic management can reduce the risk of an unfavorable outcome. Similarly, prevention involves better management of ocular trauma and other causal factors.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study

References

- [1] Yu MC, Höfling-Lima AL, Furtado GH. Microbiological and epidemiological study of infectious keratitis in children and adolescents. *Arq Bras Oftalmol.* 2016 Sep-Oct;79(5):289-293
- [2] Dhakhwa K, Sharma MK, Bajimaya S, Dwivedi AK, Rai S. Causative organisms in microbial keratitis, their sensitivity pattern and treatment outcome in western Nepal. *Nepal J Ophthalmol.* 2012 Jan-Jun;4(1):119-27.
- [3] Chirinos-Saldaña P, Bautista de Lucio VM, Hernandez-Camarena JC, Navas A, Ramirez-Miranda A, Vizuet-Garcia L, Ortiz-Casas M, Lopez-Espinosa N, Gaona-Juarez C, Bautista-Hernandez LA, Graue-Hernandez EO. Clinical and microbiological profile of infectious keratitis in children. *BMC Ophthalmol.* 2013 Oct 16;13:54.
- [4] Passos R.M., Cariello A.J., Yu M.C., Höfling-Lima A.L. Microbial keratitis in the elderly: a 31-year review. *Arq Bras Oftalmol.* 2010;73:315–319. - PubMed
- [5] Ibrahim M.M., Vanini R., Ibrahim F.M. Epidemiology and medical prediction of microbial keratitis in southeast Brazil. *Arq Bras Oftalmol.* 2011;74:7–12. - PubMed
- [6] Cao J., Yang Y., Yang W. Prevalence of infectious keratitis in central China. *BMC Ophthalmol.* 2014