

Research Article



Ocular Infection in Children: Epidemiological, Clinical and Therapeutic Aspects at the Centre for the Application of the Diploma of Specialised Studies in Ophthalmology (CADES/O) of the Donka National Hospital

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Abstract:

Introduction: Ocular infections in children are a real public health problem, especially in underdeveloped countries.

The aim of our study was to investigate ocular infections in children at the Centre d'application du diplôme d'études spécialisées en Ophtalmologie (CADES/O) of the Donka National Hospital.

Material and methods: This was a prospective descriptive study lasting 6 months from 1 March 2021 to 31 August 2021.

All children of any age, sex or origin who were seen for eye infection and treated and whose parents agreed to complete the questionnaires during the study period were included in this study.

The study variables were quantitative and qualitative.

Results: The hospital incidence of childhood eye infections was 10% (n=421). The average age of our respondents was 8 ± 5 years (7 days and 17 years). There was a male predominance of 50.6% with a sex ratio (M/F) of 1. The reasons for consultation were dominated by pruritus and ocular redness, i.e. 64.4% and 48.0% respectively. 77.7% of ocular infections in our study were of bacterial origin, i.e. a total of 327. The medical treatment of ocular infections in children was mostly local antibiotics, i.e. 90.3%, and the surgical treatment was the subconjunctival injection of corticoids, i.e. 36.4%. The evolution remained favourable in 96% of cases.

Conclusion: Children's eye health is an important public health issue, which can have enormous consequences. A specific study on each of the eye infections would be necessary to better understand this phenomenon.

Key words: *Ocular infections, child, epidemiology, clinical, therapeutic, Donka.*

Introduction

Ocular infections refer to the invasion and multiplication of micro-organisms within the eye and can be of bacterial, viral, parasitic or, more rarely, mycotic origin.

Ocular infections in children are an integral part of our daily practice and are responsible for many clinical manifestations including ocular lesions [1].

Children's eye health is an important public health issue, particularly in underdeveloped countries. The consequences of inaction go far beyond vision, affecting education, social integration and future economic productivity [2].

Ocular infections are most often caused by sinus infections (85%) or skin infections (10%), but all causes of locoregional infections can be found (5%): lacrimal tract infection, facial fracture,

oculo-orbital surgery or dental abscess [3].

A better understanding of the risk factors, pathogens, clinical manifestations and treatment strategies specific to children is necessary for optimal management of these infections [1].

The treatment of ocular infections is very often based on antibiotic eye drops, anti-inflammatory drugs and local or general corticosteroids; often these treatments calm the outbreak, but do not prevent recurrences, which occur within a variable and unpredictable time frame [4].

The prevalence of eye infections in children varies according to the cause.

In 2004, a study by **P Moradi et al.** in the USA showed a prevalence of 52% to 91% of uveitis in children [5].

Philippe M. reported in his doctoral thesis in medicine at the University of Lorraine (France) in 2005 on uveitis in children a prevalence of 5% to 6%. [6].

In 2017, a study in Burkina Faso by **Barro M et al.** reported a 69.2% prevalence of eye involvement in children infected with human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) [7].

Thus, the high frequency of eye infections in children, the potentially dramatic consequences and the lack of epidemiological data on eye infections in children in the Republic of Guinea motivated the present study.

In order to carry out this work, we set ourselves the objective of studying eye infections in children at the Centre for the Application of the Diploma of Specialised Studies in Ophthalmology (CADES/O) of the Donka National Hospital.

Material and Method

The centre for the application of the diploma of specialised studies in ophthalmology (CADES/O) at the Donka national hospital served as the setting for this study.

All children with eye infections who received treatment with CADES/O during the study period were used as material.

This was a prospective descriptive study lasting 06 months from 1^{er} March 2021 to 31 August 2021.

All children aged 0-17 years with a diagnosis of

ocular infection at the Centre d'application des diplômes d'études spécialisées en ophtalmologie (CADES/O) of the Donka National Hospital during our study period.

We conducted a comprehensive sampling using the inclusion criteria of all children aged 0-17 years, of any sex and from any country, who were received and diagnosed with eye infection and treated and whose parents or guardians agreed to complete the questionnaires during the study period.

Our study variables were quantitative and qualitative.

Results

From 1^{er} March 2021 to 31 August 2021, we conducted a prospective descriptive study at the Centre d'application du diplôme d'études spécialisées en Ophtalmologie (CADES/O) of the Donka National Hospital. It consisted of collecting data on eye infections in children. Our main limitations and difficulties were the failure of some patients to keep appointments, the health crisis caused by Covid-19, the inability to take samples, the low level of education and the low standard of living of patients, and the failure of patients to have certain tests such as CT scans. Despite these difficulties and limitations, we were able to obtain a sufficient sample size to achieve the various objectives and minimise the biases of this work.

During this period, we received 4212 children in consultation. The diagnosis of ocular infection was retained in 421 children, i.e. a frequency of **10%**, and 3791 children, i.e. 90%, consulted for another pathology.

The under-5 and 5-9 age groups were the most affected with 12a cases each, representing a frequency of 29.5%. The average age was 8 ± 5 years with extremes of 7 days and 17 years.

We found no significant difference between the two sexes, i.e. 50.6% for men and 49.4% for women, with a sex ratio of 1.03.

The majority of our patients resided in urban areas (82.4%, 347 cases), 11.4% (48 cases) in peri-urban areas and only 6.2% (26 cases) in rural areas.

In 41.3% of cases, the children were attending primary school, in 20.2% of cases secondary

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school, in 29.5% of cases not attending school and in 9% of cases attending Koranic school.

The distribution according to ophthalmological history allowed us to identify 87.1% of previous

conjunctivitis, 7.5% of uveitis cases, 3.2% of styes cases and 2.2% of blepharitis cases. 77.9% had no previous infections.

Table I: Distribution of the 421 cases of eye infections in patients aged 0-17 years consulted at CADES/O from 1^{er} March 2021 to 31 August 2021 according to the reasons for consultation.

Reasons for consultation	Workforce	Percentage
Pruritus	271	64,4
Redness of the eye	202	48,0
Eye pain	155	36,8
Secretions	142	33,7
Watery eyes	85	20,2
Palpebral edema	72	17,1
Decreased visual acuity	44	10,5
Photophobia	36	8,6
Visual blur	31	7,4
Foreign body sensation	17	4,0
Headaches	12	2,9
Tingling	10	2,4
Blepharospasm	5	1,2

The mode of onset was progressive in the majority of cases, i.e. a frequency of 80.5% (239 cases) and acute in 19.5% of cases (82 cases).

In 67.7% of cases it was a single attack, in 18.8% of cases it was a recurrence and in 13.5% of cases it was a tipping point.

The distribution according to the average consultation time was greater than 14 days in 56%

of cases (late); between 7 and 14 days in 25.2% of cases (medium); and less than 7 days in 18.8% of cases (early). The average delay was 160.4 days \pm 301 days with extremes between 1 and 1460 days. According to laterality, the damage was bilateral in 71.3% of the cases (300 cases), it involved the right eye in 16.4% of the cases (69 cases) and 12.3% in the left eye.

Table II: Distribution of 366 eyes of patients aged 0-17 years seen at CADES/O from 1^{er} March to 31 August 2021 according to their uncorrected distance visual acuity

Visual acuity OD	Workforce	Percentage
>3/10 - 10/10	226	61,8
<3/10 - >1/10	70	19,1
<1/10 - >1/20	58	15,8
<1/20	12	3,3
Total	366	100
Visual acuity OG	Workforce	Percentage
>3/10 - 10/10	202	57,4
<3/10 - >1/10	96	27,3
<1/10 - >1/20	32	9,1
<1/20	22	6,2
Total	352	100

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The infection was located in the anterior segment in 67% of cases, in 7.6% of cases in the posterior segment. The adnexa were affected in 25.4% of cases.

Slit lamp examination revealed multiple lesions. The main ones marked in the right eye by: conjunctival hyperaemia in 20.4% of cases,

secretions in 18.5% of cases, limbitis and follicles in 10.7% of cases, uveitis in 3.3% of cases. The rest were marked by minor signs such as KPS, hyphaema. In the left eye the lesions were similar with different frequencies, conjunctival hyperaemia in 14.7% of cases, secretions in 13.7% of cases, limbitis in 13.1% of cases.

Table III: Distribution of the 421 cases of ocular infections in patients aged 0-17 years consulted at CADES/O from 1^{er} March 2021 to 31 August 2021 according to intraocular pressure.

OD IOP (mm Hg)	Workforce	Percentage
≤ 9 mm Hg	2	3,6
10-15 mm Hg	47	83,9
16-21 mm Hg	6	10,7
> 21 mm Hg	1	1,8
Total	56	100,0
Mean IOP OD: 13.2 ± 2.6 mm Hg Extremes: 7 and 22 mm Hg		
OG IOP (mm Hg)	Workforce	Percentage
≤ 9 mm Hg	2	3,6
10-15 mm Hg	50	89,3
16-21 mm Hg	3	5,3
> 21 mm Hg	1	1,8
Total	56	100,0
Mean OG IOP: 12.9 ± 2.0 mm Hg Extremes: 8 and 22 mm Hg		

In the right eye, the fundus examination was normal in the majority of cases (95.6%), in 2.2% of cases there were asymmetric papillary excavations, hyalitis in 1.3% of cases, retinitis and

choroiditis in 0.4% of cases each.

The fundus examination of the left eye was also normal in 97.4% of cases. Marked by hyalitis in 1.5% of cases and hyalitis in 1% of cases.

Table IV: Distribution of the 421 cases of eye infections in patients aged 0-17 years consulted at the CADES/O from 1^{er} March 2021 to 31 August 2021 according to the selected diagnosis.

Selected diagnosis	Workforce	Percentage
Blepharitis	10	2,4
Conjunctivitis	220	52,3
Orbital cellulitis	13	3,1
Chemosis	1	0,2
Dacryocystitis	6	1,4
Superinfected LCET	123	29,2
Orgelet	12	2,8
Keratitis	7	1,7
Uveitis	23	5,5

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Blepharitis + Conjunctivitis	2	0,5
Conjunctivitis + Dacryocystitis	1	0,2
Conjunctivitis + Stye	2	0,5
Conjunctivitis + Uveitis	1	0,2
Total	421	100

According to the type of probable ocular infection, the infection was bacterial in 77.7% (327 cases) of the cases; parasitic in 14.7% (62 cases) of the cases and viral in 7.6% (32 cases). This distribution was based on a fairly rigorous set

of clinical arguments.

The medical treatment was administered locally and sometimes generally. The molecules administered depended on the aetiology but also on the associated signs.

Table V: Distribution of the 421 cases of eye infections in patients aged 0-17 years consulted at the CADES/O from 1^{er} March 2021 to 31 August 2021 according to medical treatment

Treatment	Workforce	Percentage
Local route		
Topicals :		
- Antibiotics	415	98,6
- Anti-inflammatories	267	63,4
- Antibiotics	92	21,8
- Healing agents	63	15
Oral route	175	41,6
Eyelid care physical treatment	11	2,6

In some cases, surgical treatment was necessary for greater efficacy. Eleven patients benefited from this, including subconjunctival injections in 7 cases; stye surgery in 2 cases; orbital cavity repair and periectomy in 1 case each.

After treatment, we encountered complications in 17 cases, marked mainly by recurrent keratitis, iridocrystalline synechiae and exophthalmos.

The evolution was favourable in the majority of cases, i.e. in 96% of cases, marked by a regression of the symptoms and an improvement in the clinical state.

Discussion

From 1^{er} March 2021 to 31 August 2021, we conducted a prospective descriptive study at the Centre d'application du diplôme d'études spécialisées en Ophtalmologie (CADES/O) of the Donka National Hospital. It consisted of collecting data on eye infections in children.

Our main limitations and difficulties were the failure of some patients to keep appointments, the health crisis due to Covid-19, the inability to take samples, the low level of education and the low standard of living of patients, and the failure of patients to have certain tests such as CT scans. Despite these difficulties and limitations, we were able to obtain a sufficient sample size to achieve the various objectives and minimise the biases of this work.

During this study, we collected 421 cases of eye infections in children, which represents a frequency of **10%**. The low socio-economic level of the population, promiscuity, environmental pollution and insufficient hygiene rules could explain this result.

The average age of our patients was **8 years** with extremes from **7 days to 17 years**. This result is higher than that of **Maitray A. et al.** [8] in **2019** in **India** who reported a mean age of **6.8 years**. Children are in close contact with many other children in nurseries, day-care centres and Koranic

schools and are therefore susceptible to the transmission of eye diseases and also from close physical contact in daily life with parents and other relatives.

Both sexes are affected in similar proportions with a slight male predominance of 213 cases or **50.6%**. This result differs from that of **Wong et al.** [9] in **2011** in **China** who found a female predominance of **54.3%**. Our results could be justified by the fact that in our African customs, the place of the young girl is at her mother's side, helping her to accomplish the various household tasks. The boys, on the other hand, play various games together, particularly football, in the streets and are therefore in direct contact with dust and waste water, exposing them not only to eye diseases but also to digestive and skin diseases...

Most of our patients were from urban areas. This high frequency of eye infections in children is thought to be due to the fact that in these areas the environment is polluted with dust, rubbish and sewage, which provide a favourable environment for the multiplication of pathogens (or vectors) responsible for eye infections.

According to the level of education, the majority of our patients were at primary level. School is the place where children spend their day together and this layer is much more in contact with germs. Limited information and knowledge could also explain this result.

22.1% of our patients had a history of ocular infection. The recurrent nature of ocular infections could justify this.

The reasons for consultation were dominated by pruritus, ocular redness, ocular pain and secretions in **64.4%**, **48.0%**, **36.8%** and **33.7%** respectively. **Ombwa EA. et al.** [10] in **2009** in **Cameroon** reported that **34.8%** of consultations were for reduced visual acuity, **20.9%** for pruritus and **19.0%** for pain. These symptoms are frequently encountered in cases of ocular involvement.

According to the consultation time, the majority of our patients consulted within a minimum of **14 days**. This would be due to the fact that in our context, patients do not come for consultation as soon as the first signs appear. They use self-medication or prefer to go to traditional practitioners. It is when the symptoms persist that they call a health professional.

Conjunctival hyperhaemia is the most common sign found on slit lamp examination. Red eye is an ophthalmic emergency and it would be very useful to determine the aetiology in order to improve management

Conjunctivitis was the main diagnosis in **220 cases** or **52.3%**. This result is superior to that of **Ombwa EA. et al.** [10] in **2009** in **Cameroon** who found **33%** of conjunctivitis cases. Climate change and poor sanitation in the environment where these children live could explain this result.

77.7% of eye infections in our study were of bacterial origin, i.e. 327.

The medical treatment of ocular infections in children was mostly local antibiotics, i.e. 90.3%, and surgical treatment was the subconjunctival injection of corticoids, i.e. 36.4%. The evolution was favourable in almost all cases of ocular infections encountered, i.e. 96%. The infrequent recourse to surgery in our study can be explained by the fact that in our series the main diagnosis retained was conjunctivitis, which is a benign pathology that responds well to medical treatment and does not require surgical intervention except in the case of a complication.

Conclusion

At the end of this study, it appears that ocular infections in children constitute a real public health problem, especially in underdeveloped countries. They are diverse but dominated by conjunctivitis. Most of them are of bacterial origin and affect both sexes without exception, with a slight male predominance. Proper medical treatment has resulted in a cure in almost all cases.

A specific study on each of the eye infections would be necessary to better understand this phenomenon.

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