

Red Eye in Children Aged 0 to 15 Years at the Cades/O of the Donka National Hospital in Conakry

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Abstract

General Objective: To study the red eye in children from 0 to 15 years old at CADES/O.

The Application Centre for the Diploma of Specialized Studies in Ophthalmology (CADES/O) served as a framework for the realization of this study. This was a prospective study of descriptive type of a duration of 5 months from March 22 to August 22, 2021.

Results: During our study period, we received in consultation 719 children, those who consulted for a red eye represented 502 cases or 69.8% of cases and 217 children or 30.2% consulted for other pathologies.

The age group from 1 to 5 years was the most affected with 178 cases or 35.5%. The average age was 7.5 years with extremes of 14 days and 15 years.

According to the reason for consultation, pruritus and eye redness were the master symptoms, 337 (67.1%) and 302 (60.2%) respectively, followed by lacrimation to 117 cases (23.3%) and secretions to 61 cases (12.2%).

After treatment, the evolution was favorable in 413 cases or 82.3% marked by a regression of the symptomatology and a renewed visual acuity. In 17.7% of cases, we observed recurrences.

Keywords: Red Eye; Child; Conjunctiva; Conakry

Introduction

Red eye is vasodilation of the conjunctival and/or scleral and episcleral vessels that accompanies conjunctival, corneal, scleral, or palpebral lesions, increased ocular pressure or intraocular inflammation [1].

A red eye may result from bacterial or viral infection, ocular allergies, dry eye [2-4], or may be a manifestation of a more serious underlying disease such as angle-closure glaucoma [2,5,6], anterior uveitis [2,7].

Three types of redness are classically described: diffuse redness, localised redness and the perikeratitis circle. In the case of a red eye in children, many different aetiologies can be considered, depending on whether it is painful or not, with or without a drop in visual acuity.

Management depends on the etiology [8]. It should be noted that in some cases, conjunctival hyperaemia may regress in the absence of treatment after a few days [8].

Often seen in the paediatric population, red eye accounts for 1-4% of all consultations worldwide [9].

In Asia, Livia T., *et al.* in a study of children with blepharokera to conjunctivitis, found 35 cases of red eye out of 51 children, i.e. a percentage of 68.6 [10].

In Europe, more precisely in Croatia, Petricek Igor., *et al.* reported 3467 cases of red eye out of 23569 consultations, i.e. 14.7% [2]. In France, with the aim of identifying the real ophthalmology emergencies received at the CHRU of Nancy, Agrinier N., *et al.* counted 424 cases of red eye out of 1308 patients, i.e. 32.6% [11].

In Africa, according to a study carried out in Tunis on uveitis in children, Matoussi N., *et al.* reported 6 cases of red eye out of 18 observations, i.e. 33.33% [12]. In the DRC, in a study on LCET, Chenge B., *et al.* counted 71 cases of red eye out of 139 children, i.e. 51% [13]. In Cameroon, in Yaoundé, Epée E., *et al.* reported 57 cases of red eye out of 82 children with TEFL, i.e. 70% [14]. Similarly, Ayena K.D., *et al.* counted 28 cases of red eye out of 28 newborns with conjunctivitis in the prefecture of Kozah in Togo, i.e. 100% [15].

Despite the wide availability of advice on the subject, there have been few studies designed to assess the frequency of red eye in the paediatric population. The diversity of etiologies, the paucity of data on this topic, and the absence of previous studies in the Republic of Guinea motivated the present study. We set ourselves the following objectives.

General objective

Studying red eye in children aged 0-15 years at CADES/O.

Specific objectives

- To determine the frequency of red eye in children aged 0-15 years in CADES/O;
- To determine the socio-demographic characteristics of the children who received red eye treatment;
- Investigate the etiologies of red eye in children;
- Describe the clinical features of red eye in children;
- Propose the principle of the treatment.

Materials and Methods

The Centre d'Application du Diplôme d'Etudes Spécialisées en Ophtalmologie (CADES/O) was used as a framework for this study.

Our study included all patients admitted to the CADES/O for red eye and treated during the study period. This was a prospective descriptive study of 5 months duration covering the period from 22 March to 22 August 2021.

Our study population included all children aged 0-15 years who received CADES/O and who had a clinically evident red eye that was treated or not during our study period.

The sampling was comprehensive and systematic according to our selection criteria. Our variables were epidemiological; clinical and therapeutic.

Data were collected using the KoboCollect mobile application, entered and processed using SPSS 21 software.

The main limitation was the failure to take bacteriological samples of eye secretions.

Results

During our study period, we saw 719 children in consultation, those who consulted for a red eye represented 502 cases or 69.8% of the cases and 217 children or 30.2% consulted for other pathologies.

The 1-5 year age group was the most affected with 178 cases or 35.5%. The average age was 7.5 years with extremes of 14 days and 15 years.

According to sex, we noted a slight male predominance of 51% (257 cases), and 49% (245 cases) for the female sex, with a sex ratio of 1.05.

The majority of our patients, 85%, lived in the city of Conakry and only 15% came from the interior of the country.

The majority of our patients were out of school, 68.7% (345 cases).

According to the reason for consultation, pruritus and ocular redness were the main symptoms, respectively 337 (67.1%) and 302 (60.2%), followed by lacrimation in 117 cases (23.3%) and secretions in 61 cases (12.2%).

Figure 1: Distribution of the 502 children received at Cades/o Donka according to the time of consultation from 22 March to 22 August 2021.

The mode of onset was progressive in 73% of cases (368 cases) and insidious in 27% of cases (134 cases).

The intensity of the redness was very marked in 80% of the cases and less so in only 20%.

In 83% of the cases (419 cases) the involvement was bilateral and unilateral in 17% of the cases (83 cases).

| AVLSC (OD) | Workforce | Percentage (%) |
|---------------|-----------|----------------|
| Not evaluated | 151 | 30,08 |
| 10/10-5/10 | 254 | 50,6 |
| 4/10-1/10 | 51 | 10,16 |
| <1/10 | 1 | 0,1 |
| AVLSC (OD) | Workforce | Percentage (%) |
| Not evaluated | 151 | 30,08 |
| 10/10-5/10 | 277 | 53,78 |
| 4/10-1/10 | 36 | 7,17 |

Table 1: Distribution of 502 children received at Cades/o Donka according to eye-by-eyedistance visual acuity data from 22 March to 22 August 2021.

On biomicroscopic examination, we found mainly conjunctival hyperaemia in 38 cases, hypopyon in 12 cases, corneal ulceration in 11 cases, 6 cases of PRD and 4 cases of conjunctival secretions. The rest were minor signs such as keratitis, blepharitis and iris herniation. In the left eye, the same signs were mainly found,

conjunctival hypaemia in 45 cases, 19 cases of keratitis, 9 cases of hypopyon, 8 cases of PRD, 6 cases of conjunctival secretions, as well as some minor signs.

The bilateral forms were mainly dominated by conjunctival hyperaemia in 419 cases (83.5%), followed by limbitis in 20.1% (101 cases) and some minor signs.

According to the topography, in the right eye the redness was mostly located in the upper temporonasal in 96 cases, in the lower temporonasal in 89 cases. In the eye, mainly located in the inferior temporonasal in 101 cases.

In the majority of cases, the fundus examination was normal, i.e. 86.1%, hyalitis in 2.9%, we were unable to perform it in 1.9% of cases, asymmetric papillary excavation in 1.6% of cases. In the left eye, the fundus was normal in 87.3% of cases, not performed in 1.99% of cases, hyalitis in 1.6% of cases, asymmetric papillary excavation in 0.99% of cases, and macular scarring in 0.2% of cases.

| Etiology | Workforce | Percentage (%) |
|---------------------------------------|-----------|----------------|
| Conjunctivitis | 402 | 80,08 |
| Keratitis | 34 | 6,77 |
| Subconjunctival haemorrhage | 22 | 4,38 |
| Anterior uveitis | 20 | 3,98 |
| Episcleritis Scleritis Dacryocystitis | 2 | 0,4 |
| Blepharitis | 2 | 0,4 |
| Conjunctival haemorrhage Kerato | 4 | 0,8 |
| uveitis | 5 | 0,99 |
| Hyalite Other | 9 | 1,8 |
| | 11 | 2,2 |
| | 2 | 0,4 |
| | 7 | 1,4 |

Table 2: Distribution of 502 children received at Cades/o Donka according to clinical diagnosis from 22 March to 22 August 2021.

Other: Pterygoid, burst globe, cyst, palpebral wound, corneo-scleral wound, iris hernia.

NB: A child could have one or more diagnoses.

| Treatment | Workforce | Percentage (%) |
|----------------------------|-----------|----------------|
| NSAIDS | 319 | 63,6 |
| Antibiotic corticosteroids | 277 | 55,2 |
| Antihistamines | 237 | 47,2 |
| Antibiotics | 93 | 18,5 |
| Corticosteroids | 85 | 16,9 |
| Physiological serum | 68 | 13,5 |
| Antiseptics | 22 | 4,4 |
| Healing agents | 43 | 8,6 |
| Mydriatics | 15 | 3 |
| Artificial tear | 3 | 0,6 |
| Pest control | 29 | 5,8 |
| Other | 26 | 5,2 |

Table 3: Frequency of the 502 children received at Cades/o Donka according to the topic treatment received from 22 March to 22 August 2021.

Other: Water treatment, surgery.

| Treatment | Workforce | Percentage (%) |
|-----------------|-----------|----------------|
| Antihistamines | 312 | 62,2 |
| Antibiotics | 19 | 3,8 |
| Corticosteroids | 14 | 2,8 |
| Analgesic | 5 | 1 |
| Pest control | 29 | 5,8 |

Table 4: Frequency of 502 children received at Cades/o Donka according to the general treatment received from 22 March to 22 August 2021.

After treatment, the evolution was favourable in 413 cases, i.e. 82.3%, marked by a regression of the symptoms and a recovery of visual acuity. In 17.7% of cases, we observed recurrences.

Discussion and Conclusion

We conducted a descriptive study with prospective collection, which focused on the epidemiological, clinical and therapeutic aspects of red eye in children aged 0 to 15 years who consulted and received treatment at CADES/O DONKA during the study period from 22 March to 22 August 2021. However, our study has some limitations such as the difficulty of performing bacteriological examinations of ocular secretions.

In our study, 719 children were collected and 502 or about 70% had a red eye and were treated. Our results are higher than

those found by Livia T., *et al.* [10] in Asia and Chenge B., *et al.* [13] in the DRC, who found respectively 68.6% and 51% of red eye in their study, and similar to those found by Epée E., *et al.* [14], i.e. 70% of red eye. This could be explained on the one hand by the fact that CADES/O Donka is a reference structure par excellence in the country and on the other hand by the fact that the frequency is related to all the children of the period and not to all the consultations of the same period.

In our study the average age of the children was 7.5 years. The age group 0-5 years was the most represented (39.4%). This could be explained by the exposure of children of this age to risk factors such as dust and food allergens and by their turbulence, which makes it difficult for parents to contain them. Our results are similar to those found by NANAW M.A [16] at the SOURO SANOU University Hospital in Bobo Dioulasso in his doctoral thesis on the LCET, which found an average age of 8.1 with a predominance of the 0 to 5 age group. Doumbia I. [17] in Mali in a study on LCET found an average age of 8 years close to ours. Bella [18] in Douala and Mc Molli [19] in Yaoundé reported respectively in their studies on LCET an average age of 9.4 years and 10.3 years higher than ours.

Like Everaert and Doutetien [20] and Koki G [21], we found that children aged 0 to 5 years were the most affected, contrary to Epée E [14] in Cameroon, who found a predominance of the 6 to 10 year-old age group.

Red eye was present in 257 boys and 245 girls, resulting in a slight male predominance with a sex ratio of 1.05. This could be explained by the high mobility of the children. Our results are similar to those found by KOKOU V., *et al.* [22] in Togo in a study on neonatal conjunctivitis, which found 50.3% of boys.

The majority of children aged 0-15 years received, diagnosed and treated for red eye were from the city of Conakry; this would be due to the location of the hospital in the said city.

In our study, the majority of children in our study were enrolled in school, i.e. 68.7%.

The most frequent reason for consultation in our study was pruritus (67.1%). This could be explained by the functional discomfort that it causes and the discomfort in which it puts the

child and his parents in front of the entourage. Our data are similar to those found by authors [13,14] who also found a predominance of pruritus with respective percentages of 86% and 98%. In our study, after pruritus came ocular redness with a percentage of (60.2%). Christelle D.N., *et al.* [54] in a study on LCET done in Cameroon in 2017 found ocular redness as the main reason for consultation with 88.9%.

In our study 373 children did not report a history; 50 children (9.9%) had a history of atopy. This could be explained by the existence of genetic determinants between atopic diseases and the occurrence of red eye. Similarly, this number could be attributed to a poor understanding of the notion of atopy by children or parents, thus leading to erroneous responses. NANAW M. A [16] in his study on the LCET found 37.7% with a history of atopy, which is higher than ours. On the other hand, Bonini., *et al.* [23] in Italy and Frankland., *et al.* [24] in Thailand found 49% and 69% respectively of children with a history of ocular allergy in a study on keratoconjunctivitis.

The delay in consultation was late; most children (294 or 58.6%) consulted more than a week after the onset of symptoms. Self-medication, traditional first-line treatment and the low purchasing power of parents could justify this delay in consultation. Our results are similar to those found by Assavedo R., *et al.* [25] in Benin in a study on uveitis which found 77.6% of patients who consulted more than one week after the onset of symptoms.

The location of the red eye in our study was predominantly bilateral with a percentage of 83. Our results are different from those found by Assavedo R., *et al.* [25] in Benin in a study on uveitis which found unilaterality in 100% of cases. This could be explained by the difference in the studies and the variation in the study populations.

Visual acuity could not be assessed in 151 children. This was due to the fact that these children were of pre-verbal age. 254 children (50.6%) had an acuity greater than or equal to 5/10 in the right eye and 277 in the left eye (53.8%). This could justify the number of cases of conjunctivitis and subconjunctival haemorrhages recorded in our study. 51 children (10.2%) had a visual acuity of less than 5/10 in the right eye and 36 (7.2%) in the left eye. This could justify the number of cases of keratitis and anterior uveitis recorded in our study.

Slit lamp examination revealed a predominance of conjunctival hyperaemia in all children, followed by limbitis with 20.1%. NANAW M A [16] in his thesis on the LCET found a predominance of papillae (75.4%) and frothy secretions (56.9%). This could be explained by the difference between the two studies.

In our study, the superior temporal-nasal and inferior temporal topographies were the most represented in the right eye with percentages of 19.1 and 17.7 respectively, while in the left eye the inferior temporal-nasal topography was the most represented with a percentage of 20.1. This could be explained by the numerous etiologies that can cause red eye and the particularities of the redness in each of them.

The fundus was normal in the right eye in 432 children (86.1%) and in the left eye in 438 children (87.2%). This could be explained by the age range studied.

The predominant etiology in our study was conjunctivitis with 80.1% followed by keratitis with 6.8%. This could be explained by the study period which coincided with the pollen season in Africa when conjunctivitis is most prevalent.

In our study, ametropia was associated with red eye in 65 children (13%). Our results are similar to those of Malu K N [26] in Nigeria who found 6.7% of refractive errors in a study on LCET.

The red eye being a sign due to an inflammation of one of the structures of the eye, the majority of children in our study benefited from a treatment based on NSAIDs with a percentage of 63.6%, followed by antihistamines and antibiotics with respective percentages of 62.1% and 55.2%. Boussouki bakoussou M.S [27] in Guinea, in his doctoral thesis in medicine in 2018 on LCET, had reported that antihistamines with 97.2% constituted the specific treatment that children received. Adjoumani K.B.D [28]. Adjoumani K.B.D [28], in a study on TEFL in Côte d'Ivoire, found that antihistamines were the most prescribed treatment with 56.6%, followed by antibiotic corticoids with 42.5%.

During our study period, we noted a clear favourable outcome during treatment in the majority of children (82.3%), which could be explained by the good medical follow-up and the effectiveness of the treatment administered to the children. However, we noted an unfavourable outcome in some patients. Indeed, during the

treatment, some children presented superinfections or a recurrence after some time. This could be explained by their failure to comply with the treatment. However, a small number of recurrences (17.7%) were encountered. Our study is superimposed on that of Adjoumani K.B.D [28] who found in his study that the evolution under medical treatment was favourable in 82.1% of patients with reduction of functional signs and normalisation of physical signs.

Conclusion

At the end of this study, it was found that the 1 to 5 year old age group was the most affected. According to sex, we noted a slight male predominance. Pruritus and ocular redness were the main reasons for consultation. After treatment, in most cases the evolution was favourable with regression of the symptoms without sequelae.

Early consultation could improve this prognosis.

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