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Causes of Visual Impairment and Blindness in Children Aged 0 to 15 Years Old at the Application Center for the Specialized Studies Diploma in Ophthalmology (CADES/O) at the Donka National Hospital in Conakry, Guinea

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Abstract **Original Research Article**

***Introduction*:** Visual impairments and blindness are conditions in which visual acuity is less than 3/10. Several conditions may be involved in their occurrence in children in developing countries where they pose a public health problem due to the burden they place on society. Conditions responsible for visual impairment or blindness in children are very common in CADES/O in current practice despite the paucity of data on them. Our study aimed to determine the main causes of visual impairment and blindness in children in Cades/o. ***Methodology*:** This was a retrospective, cross-sectional, descriptive study. ***Result* :** We carried out 7281 consultations including 1200 children or 16.48%. The male sex was the most frequent with 58.83%, giving a sex ratio of 1.43 M/F. The age groups 3-5 years 21.67% and 0-2 years 21.58% were the most represented. Tropical endemic limbo-conjunctivitis (LCET) 26.17% and other forms of conjunctivitis 25.5% were the main diagnoses retained followed by ametropia 15.66% and trauma sequelae 12.17%. Trauma sequelae were by far the most found causes of visual impairment and blindness with 36.94% of cases, followed by uncorrected ametropia in 23.42% of cases. Trauma sequelae followed by uncorrected ametropia were the main causes of visual impairment. Trauma sequelae followed by lens pathologies were the most common causes of blindness.

Keywords: Eye Conditions, Visual Impairment, Blindness, CADES/O.

INTRODUCTION

Visual impairment and blindness are conditions that commonly occur in children in developing countries where they pose a public health problem due to the burden they place on society. The leading cause of visual impairment in children is uncorrected refractive error, affecting approximately 12 million children, which can be easily corrected with glasses [7]. The prevalence and leading causes of blindness in children vary considerably across regions due to variability in socioeconomic development and under-5 mortality rates [3].

Prevalence ranges from 0.3/1,000 children in high-income countries to 1.5/1,000 in low-income countries [3,4]. Worldwide, an estimated 19 million children have visual impairment (defined as Snellen visual acuity less than 6/12 or less than 20/40 in the better eye). Visual impairment can have a profound effect on child development, quality of life, educational attainment, and economic productivity [5, 6].

The revised 2010 estimate showed that the number of blind children worldwide had fallen to 1.26 million, compared to the previous estimate in 1999 of 1.4

million. However, in sub-Saharan Africa, the number of blind children increased by 31% to 419,000 [1]. Many of the causes of serious visual impairment and blindness in children are preventable or treatable, and therefore, controlling blindness in children is a high priority for the WHO and the International Agency for the Prevention of Blindness (IAPB) VISION2020 initiative, the Right to Sight [2].

A study on the causes of visual impairment and blindness conducted in Bangladesh showed that the prevalence of blindness in children is about 0.7–0.8/1000 and that the country has about 36,000–40,000 blind children, two-thirds of whom are of school-going age [8]. Results of standardized population-based surveys conducted in Asia, Africa, and Latin America on the prevalence and causes of functional low vision in school-aged children involving 4082–6527 children aged 5 (or 7)–15 years found an overall prevalence of 1.52 per 1000 children [9].

The lack of previous studies on the conditions responsible for visual impairment or blindness in children, as well as the diversity of the clinical picture, motivated us to conduct this study, the objective of which was to study the main causes of visual impairment and blindness in children aged 0 to 15 years at the Center for the Application of the Diploma of Specialized Studies in Ophthalmology (CADES/O) at the Donka National Hospital in Conakry, Guinea.

Patients and Methods

This was a retrospective, cross-sectional, descriptive study. It took place over a period of 6 months from January 1 to June 30, 2019 inclusive, at the Center for the Application of the Diploma of Specialized Studies in Ophthalmology (CADES/O) of the Donka National Hospital in Conakry (Guinea). It focused on children aged 0 to 15 years who consulted at the CADES/O of the Donka National Hospital in Conakry and who were diagnosed with visual impairment or blindness. The sampling was exhaustive and included all the records of children aged 0 to 15 years who consulted during our study period, whether or not they had visual impairment or blindness. The collected data were entered and presented using Word and Excel software. The analysis was done using Epi data and SPSS data analysis software.

Results

Over a six-month period (January 1, 2019 to June 30, 2019), we were able to retrieve 7,281 patient records for consultations, including 1,249 children's records, or 17.15%. Among these children's records, 49 records were insufficiently completed, giving us a sample of 1,200, or 96.08% of children's records during the study period.

The male gender was the most represented with a male/female sex ratio of 1.43 (Table I). The 3-5 age group was the most represented with a number of 260 children or 21.67% (Table II). Schoolchildren were the most represented with a number of 791 children or 65.92% (Table III). Patients who came by themselves were the most represented mode of admission with a number of 1153 children or 96.08%. Children referred by other structures numbered 47 or 3.92%. In total, 2383 complaints were recorded for the 1200 patients received, or an average of 2 complaints per patient. Redness and/or discharge was the most common complaint with a sample size of 605 children or 25.39% followed by pruritus and/or the sensation of sand in the eyes with a sample size of 589 children or 24.72% (Table IV). Conjunctivitis other than limbo-conjunctivitis was by far the most common diagnosis with 306 cases or 25.5% (Table V). 50% of children had good visual acuity on the day of their consultation. 40.75% of children admitted during the study period did not benefit from visual acuity due to their young age. This gives us a sample size of 111 children (9.25%) with visual impairment and blindness depending on the causes (Table VI). Trauma sequelae were by far the most common causes of visual impairment and blindness with 40 cases found or 36.94% followed by uncorrected ametropia with 26 cases or 23.42%. In the sample, no case of blindness was attributed to uncorrected ametropia or corneal pathologies (Table VII). Trauma sequelae followed by uncorrected ametropia were the most common causes of visual impairment with 35.80% and 32.10% respectively (Table VIII). Trauma sequelae followed by lens pathologies were the most common causes of blindness with 40.00% and 26.67% respectively.

Annexes:

Table I: Distribution of children by sex

Sex	Staff(s)	%
Male	706	58.83
Female	494	41.17
Total	**1200**	**100**

Table II: Distribution of children by age group

Age group	Staff(s)	%
0-2 years	259	21.58
3-5 years	260	21.67
6-8 years old	189	15.75
9-11 years old	205	17.08
12-14 years old	200	16.66
>14 years old	87	7.26
Total	**1200**	**100**

Table III: Distribution according to education

Schooled	Staff (n)	%
Yes	791	65.92
No	409	34.08
Total	**1200**	**100**

Table IV: Distribution of children according to complaints on arrival

Complaints upon arrival	Staff (n)	%
Pain	350	14.69
Watering eyes	219	9.19
Photophobia	104	4.36
Decreased Visual Acuity	243	10.20
Diplopia and/or nystagmus	21	0.88
Itching and/or gritty feeling	589	24.72
Redness and/or discharge	605	25.39
Concept of trauma	169	7.09
Leukocoria	28	1.17
Headache	46	1.93
Others	9	0.38
Total	**2383**	**100**

Table V: Distribution according to the diagnosis retained

Diagnosis retained	Staff(s)	%
Sequelae of Trauma	146	12.17
Ametropia	188	15.66
LCET	314	26.17
Other Conjunctivitis	306	25.5
Lens pathologies *	38	3.16
Pathologies of VL	15	1.25
Retinoblastoma	14	1.16
Corneal pathologies**	57	4.75
Glaucomatous neuropathy	41	3.41
Others	81	6.75
Total	**1200**	**100**
* cataracts and ectopia lentis		
**corneal ulcers, keratitis and keratoconus.		

Table VI: Distribution of children according to visual acuity at admission

Visual acuity	Staff (n)	%
≥ 3/10*	600	50
< 3/10 **	81	6.75
< 1/20***	30	2.50
Not done ****	489*	40.75
Total	**1200**	**100**

* Normal acuity
** Visual impairment
*** blindness
****Not done due to the child's age

Table VII: Distribution of children with visual impairment according to causes

Causes of visual impairment	Staff (n)	%
Uncorrected ametropia	26	32.10
After-effects of trauma	29	35.80
Lens pathologies	4	4.94
Corneal pathologies	19	23.46
Glaucomatous neuropathy	3	3.70
Total	**81**	**100**

*Visual impairment = AV < 3/10 **Blindness = AV < 1/20

Table VIII: Distribution of children with blindness according to causes

Causes of blindness	Staff (n)	%
After-effects of trauma	12	40.00
Lens pathologies	8	26.67
Glaucomatous neuropathy	1	3.33
Sequelae of enucleation	7	23.33
Cortical blindness	2	6.67
Total	**30**	**100**

DISCUSSION

1) Sociodemographic Characteristics

In our study, we found a male predominance of 58.83% (n=706) against 41.17% (n=494) for the female sex, i.e. a sex ratio of 1.43 M/F. These results corroborate those found by Munit MA *et al*., who conducted their study on the causes of visual impairment and blindness in Bangladesh and found a male predominance (63.1%) of boys against 36.9% of girls) [8]. The same is true of that conducted by Yameogo J. on the causes of visual impairment in children in Ouagadougou, which also found a male predominance of 61% against 39% of girls [11].

The age groups 3-5 years (n=260) 21.67% and 0-2 years (n=259) 21.58% were the most represented in our study. These results are contrary to those of Yameogo J who showed that the largest number of their patients were in the age group of 10 to 12 years or 28.7%. 1157 (96.42%) of the patients included in our study resided in Conakry. The same is true of the study conducted by Yameogo J. on the causes of visual impairment in children in Ouagadougou who found that 80.75% of their patients came from the city of Ouagadougou [11]. On the contrary, the study on the Causes of Visual Impairment and Blindness in Bangladesh conducted by Muhit MA *et al*., where the majority of children included in the study were from rural areas 95.4% [38]. At their inclusion in our study, 791 (65.92%) of our participants were in school. Yameogo J. found in his study that 70.25% of his target was in school at the time of the survey [11].

2) Clinical Characteristics

Almost all of the children included in our study came to consult on their own (n=1153) children or 96.08%, against (n=47) or 3.92% referred by health structures. This can be explained by the nature of the complaints identified below which generally accompany eye disorders or by the fact that health structures are not well aware of the possible seriousness of not treating these conditions. Redness and/or secretions were the most common complaints with a number of (n=605) children or 25.39% followed by pruritus and/or the sensation of sand in the eyes with a number of (n=589) children or 24.72%. Trauma sequelae (n=29) 35.80% followed by uncorrected ametropia (n=26) 32.10%, corneal pathologies (n=19) 23.46% and lens pathologies (n=4) 4.94% represented the main causes of visual impairment found in our study. These results are close to those found by Vasudha K *et al*., on the emerging trends of blindness and ocular morbidity in children in India where they noted that the most common cause of ocular morbidity was refractive errors (2.77%) [38]. Also Yameogo J. found in his study that 37.42% of the impairments were due to trauma followed by corneal scars and opacities in 12.86% of cases. [11]. Trauma sequelae (n=12) 40.00%, lens pathologies (n=8) 26.67% and enucleation sequelae for retinoblastoma (n=7) 23.33% were the main causes of blindness found. Adhikari S *et al*., found in their study among children in Nepal that visual impairment and blindness were in most cases caused by amblyopia, the most common cause being uncorrected refractive error, contributing 42.9% of the cases of blindness. Similarly, cases of cataract, microphthalmia and retinal pathology were also observed in blind children [40]. Yameogo J. found in his study that the main causes of blindness in children in Ouagadougou were corneal scars and opacities in 22% of cases followed by cataracts in 20.70% of cases [11]. Rajiv K *et al*., in their study on the status of childhood blindness and functional low vision in the Eastern Mediterranean region reported that in industrialized countries, central visual function abnormalities due to perinatal and hereditary causes, retinal dystrophy and retinopathy of prematurity are the main causes of blindness in children ; while infection, malnutrition, trauma, uncorrected refractive error, and unexploited cataract are the main causes of visual impairment in developing countries [41].

CONCLUSION

This study allowed us to understand that eye conditions responsible for visual impairment and/or blindness are common in daily practice at Cades/o. We noted a predominance of males. The 3-5 year age group was the most represented. The majority of our patients came from Conakry. Trauma sequelae were by far the most common causes of visual impairment and blindness with 41 cases, followed by uncorrected ametropia with 26 cases. In the sample, no case of blindness was attributable to uncorrected ametropia or corneal pathologies. Trauma sequelae followed by uncorrected ametropia were the most common causes of visual impairment with 29 cases and 26 cases respectively. Trauma sequelae followed by lens pathologies were the most common causes of blindness with 12 cases and 8 cases respectively.

Limitations of the Study

Our study was limited in time (6 months) and space (CADES/O). In this case, we cannot extrapolate its results to the national level. It also concerned medical records, which are often poorly or insufficiently filled out.

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