

A Study of Ophthalmic Problems Among Children Attending Ophthalmic Outpatient Clinic, Suez Canal University Hospital

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Abstract

Background: Early detection of blinding eye diseases at the primary health level and organized referrals and prompt management by qualified ophthalmologists at secondary and tertiary levels in the last decade were the strategies of the eye health care programs to reduce childhood blindness. **Aim:** This study aimed to describe the causes of ocular morbidity of children attending the Ophthalmic outpatient clinic at Suez Canal University Hospital in order to have a better insight into our ophthalmic problems and update our investigation and management to overcome these problems. **Patients and Methods:** A total number of six hundred patients were examined at the ophthalmology outpatient clinic, Suez Canal University Hospitals, Ismailia, Egypt from June till the end of August 2017 (School holiday) for ophthalmic evaluation of their clinical problems. **Results:** Refractive errors were the most common cause of visual impairment, While myopia was the most common type of refractive error. There is a statistically significant difference between types of refractive errors and age. Ammetropic amblyopia is the most common type of amblyopia, esotropia is the most common type of strabismus, then Exotropia and microtropia with statistically insignificant differences. There was a statistically significant difference between types of strabismus and age. Mucopurulent conjunctivitis was the most common type of conjunctivitis, There was a statistically insignificant difference between types of corneal and conjunctival eye diseases and age. Chalazion was the most common type of eyelid disease, with a statistically significant difference. There was a statistically significant difference between types of eyelids and lacrimal system diseases and age. **Conclusion:** 62% of children had visual impairment due to refractive error, especially myopia. Correction of these errors proved to be very effective. Visual problems in young children are often undetected, thus rendering correction of errors and other causes of visual impairment indispensable in their positive impact on education and quality of life.

Keywords: Screening, pediatrics, ophthalmic, errors.

Introduction

Pediatric ocular diseases are of prime importance, most of these diseases are

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treatable up to a specific age and if left untreated may have a disastrous effect on the abilities of the child. Vision is very important for a child's development during infancy and early childhood and later on for learning and communication. There are 135 million people with true low vision in the world and among them 7 million are children. ⁽¹⁾ Approximately 1.3 million children worldwide are blind and half of these cases are preventable and treatable. 60-80 % of children die within 2 years of onset of blindness either due to underlying cause of blindness or due to lack of support for survival. Vision disorders are the fourth most common disability of children and the leading cause of handicapping conditions in childhood. ⁽²⁾ Visual impairment from uncorrected refractive errors can have immediate and long-term consequences in children and adults, such as lost educational and employment opportunities, lost economic gain for individuals, families and societies, and impaired quality of life. Pediatric ocular diseases differ from place to place and depend on socioeconomic conditions of the area. In countries with low socioeconomic strata and inadequate health care system, malnutrition and infection form major part of etiology. ⁽³⁾ Vitamin A deficiency and its ocular consequences is the single most common cause of visual impairment and blindness in children in developing world. While industrialized countries common pediatric ocular diseases are cataract, glaucoma, retinopathy of prematurity, genetically transmitted diseases and congenital anomalies. ⁽⁴⁾ In Egypt there are few studies showing the prevalence of errors of refraction. A survey conducted among 5839 Egyptian school children aged 7-15 years found that the prevalence of refractive errors (visual acuity \leq 6/12) was 22.1%. ⁽⁵⁾ A preliminary national survey done in the Helwan area of Cairo reported

that 34% of the recorded disabilities were visual disability. Knowledge on pattern of eye disease in children provides useful baseline data for planning child eye care services in a given region or the whole country. ⁽⁶⁾ Understanding the specific causes of visual reduction also helps in proper and efficient allocation and investment of resources for preventive and control measures as well as treatment of childhood eye disease. The purpose of the study is to recognize prevalence of ophthalmic disorders among children and its impact on visual impairment. This study aimed to describe causes of ocular morbidity of children attending Ophthalmic outpatient clinic at Suez Canal University hospital in order to have a better insight of our ophthalmic problems and update our investigation & management to overcome these problems.

Patients and Methods

This cross section descriptive study was conducted at the outpatient clinic, Ophthalmology Department (Suez Canal University hospital), Ismaillia, Egypt. Patients attending outpatient clinics under age of 12 years were included. Patients with age more than 12 years old and cases in emergency situation were excluded from the study. Informed consent was obtained from (Parent or attendant) of all participating cases before performing any interventions or special investigation. Study was conducted from June till the end of August 2017 (School holiday).

Methods

All the patients were subjected to

- a) clinical data collection included:
 - Demographic data, including gender, date of birth, and identity of parent/caregiver

- The chief complaint and reason for the eye evaluation
 - Current eye problems
 - Ocular history, including prior eye problems, diseases, diagnoses, and treatments
 - Systemic history, past hospitalizations and operations, and general health and development
 - Current medications and allergies
 - Family history of eye conditions and relevant systemic diseases.
 - All data was obtained from parents or caregiver
- b) Ophthalmic examination:
The examination should included the following elements:
- Binocular red reflex test
 - Assessment of fixation pattern and visual acuity: using Landolt's 'chart
 - For you age visual acuity was taken by seekig child attention with colored object
 - Binocular alignment and ocular motility
 - External ocular examination
 - Anterior segment examination
 - Pupillary Examination
 - Cycloplegic retinoscopy/refraction +/- (auto-refractometer).
 - Fundusopic examination , Dilated fundus examination: using direct (RI-scope I/Riester) and indirect ophthalmoscopy (Appasmy associates) to examine the lens, vitreous, macula, optic nerve and peripheral retina. It was done under general anaesthesia for young children.
 - intra ocular pressure (IOP) measurement: using Goldmann applanation tonometer (shin-Nippon) . In young children it was done under general anaesthesia.

- Slit-lamp bio microscopic (Topcon-Japan) examination (using Volk+90).

Statistical analysis

- Data was coded and entered into the computer statistical program using the Statistical Package for Social Science (SPSS).
- Qualitative data was presented as number and percentage while quantitative data as mean \pm Standard deviation.
- Student t test was used for quantitative variables and chi square will be used for qualitative variables.
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- p value of <0.05 was considered as statistically significant.

Ethical considerations

- The study was reviewed by ethical committee of Faculty of Medicine, Suez Canal University.
- The study procedures were in accordance with the guidelines of Helsinki declarations on human experimentation (World Medical association, 2004).
- An informed written consent was obtained from all participants before getting them involved in the study.
- All participants were informed that responding is voluntary and that they can refuse to respond without stating any reason.

- Procedures performed in the present study have no harmful effects or threatening to patients' lives.
- Participants were informed about all results of procedures and tests performed either normal or abnormal.
- Information confidentiality was kept.
- Data would not be used for other purposes.
- Each patient was offered the proper management accordingly.

Results

A total number of six hundred patients were referred to the Ophthalmology department, Suez Canal university hospitals, Ismailia, Egypt from June till the end of August 2017 (School holiday) for ophthalmic evaluation of their clinical problems. Age distribution of children included in this study are shown in Table 1.

Age	Frequency (no.)	Percentage (%)	X ²	P-value
1 month-1 year	96	16	1.35	0.351
(2-4) years	64	10.7		
(5-7) years	192	32		
(8-10) years	148	24.6		
(11-13) years	100	16.7		
Gender				
Male	368	61.3	8.34	0.004
Female	232	38.7		

*Statistical significance $p < 0.05$, Chi-square test used.

Diagnosis	Frequency (no.)	Percentage (%)
Corneal and Conjunctival diseases	119	19.8
Eyelids and lacrimal system diseases	67	11.2
Refractive errors	224	37.3
Strabismus	136	22.7
Amblyopia	16	2.7
Allergy	8	1.3
Chemical Injury	4	0.7
Congenital	26	4.3
Total	600	100

Children with mean ages of (6.74 ± 3.49) ranged from one month to twelve years with statistically insignificant differences between groups. Table 1 shows that male more than females with statistically significant difference. In table 2, Refractive er-

rors are the commonest disorder (37.3%), Strabismus (22.7%) and Corneal and Conjunctival diseases (19.8%). Children with normal vision (78.7%) are more than with visual impairment (21.3%) with statistically significant difference ($P=0.001$).

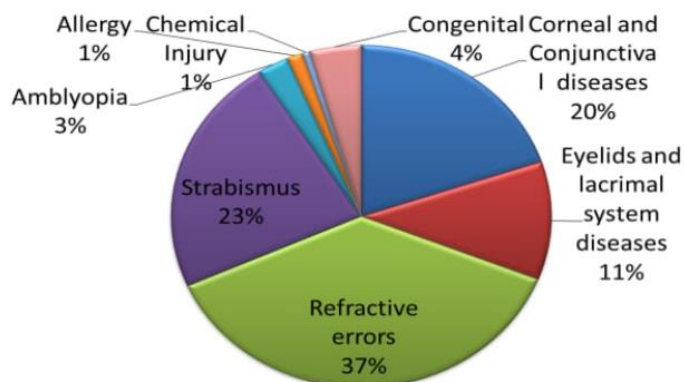


Figure 1: Distribution of eye disorders among patients.

Table 3: Age and gender distribution of children with Visual impairment.

	Age					X ²	P-value
	1months-1year	2-4 years	5-7 years	8-10 years	11-13 years		
Visual impairment	0	9	55	45	19	35.32	0.001*
Visual impairment	Gender					5.93	0.032*
	Male	Female					
	40	88					

*Statistical significance $p < 0.05$, - Fisher exact test used.

Table 4: Causes of visual impairment and distribution of refractive errors among the studied children				
Visual impaired children(<6/18)	N	%	X ²	P-value
Refractive error	79	62	52.34	<0.001*
Amblyopia	10	8		
Strabismus	21	16		
Others	18	14		
Refractive errors				
Myopia	150	67	56.68	<0.001*
Hypermetropia	45	20		
Astigmatism	29	13		

*Statistical significance $p < 0.05$, - Fisher exact test used.

In Table 3, refractive errors are the most common cause of visual impairment, then strabismus and amblyopia with statistically significant differences. Myopia is the most common type of refractive error, then hypermetropia and astigmatism with statistically significant differences (table 4). There is a statistically significant difference between types of refractive errors

and-age (table 5). Ammetropic amblyopia is the most common type of amblyopia (50%), then Idiopathic amblyopia (24%) followed by Strabismic amblyopia and Sensory deprivation amblyopia (13% for each) with statistically significant difference ($P=0.041$). There was statistically insignificant difference between types of amblyopia and age (table 6).

Table 5: Age distribution of children with refractive errors.							
Refractive errors	Age					X ²	P-value
	1months-1year	2-4 years	5-7 years	8-10 years	11-13 years		
Myopia	0	19	37	40	54	19.53	0.023*
Hypermetropia	0	18	5	9	13		
Astigmatism	0	3	7	8	11		

*Statistical significance $p < 0.05$, - Fisher exact test used.

Table 6: Age distribution of children with Amblyopia.							
Types of Amblyopia	Age					X ²	P-value
	1months-1year	2-4 years	5-7 years	8-10 years	11-13 years		
Ametropic amblyopia	5	1	1	1	0	0.542	0.783
Strabismic amblyopia	1	1	0	0	0		
Sensory deprivation amblyopia	1	0	1	0	0		
Idiopathic amblyopia	2	1	1	0	0		

*Statistical significance $p < 0.05$, - Fisher exact test used.

Table 7: Age distribution of children with Strabismus.							
Strabismus	Age					X ²	P-value
	1months-1year	2-4 years	5-7 years	8-10 years	11-13 years		
Esotropia	34	9	11	8	6	23.45	0.002*
Exotropia	19	11	7	5	6		
Microtropia	5	4	1	1	9		
Vertical tropia	0	0	0	0	0		

*Statistical significance $p < 0.05$, - Fisher exact test used.

Table 8: Age distribution of children with Corneal and Conjunctival eye diseases.							
Eyelids and lacrimal system diseases	Age					X ²	P-value
	1months-1year	2-4 years	5-7 years	8-10 years	11-13 years		
Blepharitis	0	0	0	2	6	1.98	0.002*
Chalazion	0	4	7	9	11		
Ptosis	0	0	0	0	6		
Nasolacrimal duct obstruction	1	0	0	5	17		
Stye	0	0	0	2	5		

*Statistical significance $p < 0.05$, - Fisher exact test used

Esotropia is the most common type of strabismus (50%), then Exotropia (3and microxotropia (15%) with statistically insignificant difference ($P=0.641$). There is

statistically significant difference between types of strabismus and age (table 7). Mucopurulent conjunctivitis is the most common type of conjunctivitis (74%), then

Allergic conjunctivitis (12%) followed by keratoconus and Keratitis (6% for each) and Subconjunctival hemorrhage (2%) with statistically significant difference ($P=0.041$). Age distribution of children with Corneal and Conjunctival eye diseases showed that the majority of Mucopurulent conjunctivitis at age group 5-7 years then 2-4 years followed by 1months-1year with statistically insignificant difference ($P=0.532$). Chalazion is the most common type of eyelid diseases (46%), then Nasolacrimal duct obstruction (23%) followed by Blepharitis (12%), Stye (10%) and Ptosis (9%) with statistically significant difference ($P=0.021$). There was a statistically significant difference between types of eyelids and lacrimal system diseases and age (table 8).

Discussion

Children with undetected vision problems join school and often perform poorly, leading to leaving school and abandoning education, with social and economic consequences. Presenting vision was defined as VA in the better eye, using currently available refractive correction, if any. According to WHO guidelines, this is to be used for all population-based studies⁽⁷⁾. Visual impairment was detected in 600 children (21.3%) in the current study. This is relatively low when compared to national study in South Sinai in which prevalence was (29.4%)⁽⁸⁾. Another recent Egyptian study could identify 1041(40%) children with eye problems during screening⁽⁵⁾. Our prevalence estimate was also higher than (7.0%) of Saudi Arabian preschool children reported by Al-Rowaily⁽⁹⁾. This prevalence of visual impairment is relatively high when compared to regional studies that reported a prevalence of 9.4% (Gondor town in Ethiopia),⁽⁴⁾ and only 5% (a study on 400 preschool Malaysian chil-

dren), although VA56/9 was defined as subnormal/impaired vision⁽¹⁰⁾. Visual impairment was significantly more prevalent among young (5–10 years) children ($p=0.001$) and girls (69%). *Wen and co-authors* reported different rates of visual impairment (40%, 17% and 9%) from refractive error in the three different locations of their study in Croatia.⁽¹¹⁾ The prevalence of refractive error in the entire sample was 37.3% and their age between 5-10 years. A figure that is similar to the 11.6% reported in a study of 623 children from Kampala.⁽¹²⁾ *Chia and colleagues* showed a relatively high prevalence rate (18.5%), however, the children in their study were 6–7 years, an age normally known for a high incidence of refractive error⁽¹³⁾. Refractive error represents one of the main causes of visual impairment with a prevalence rate ranging from 43–95%⁽¹⁴⁾. In the current study, refractive error was the cause of 62% of impaired vision. The prevalence of refractive error differs according to sample, cut-off point and age group (within which a myopic shift occurs with age)⁽¹⁵⁾. Myopia was the most prevalent refractive error (67%), followed by hypermetropia (20%) and astigmatism (13%). The prevalence of myopia was found in this study to be 67%, which was not similar to that of 6.8% in Chile, 6.0%^(16,17). The results of this study showed that schoolchildren in older ages and higher grades had a higher prevalence of myopia, which was similar to studies conducted in Vietnam and Ethiopia⁽¹⁵⁾. This associated increase in the prevalence of myopia with ages and grade levels may be because of decreased outdoor activity of many children and this has been reported as an issue in other papers. This study found that there was no significant difference in the prevalence of myopia between male and female children. Another recent Egyptian study was carried out on 500 patients re-

cruited from the Outpatient Clinic of the Ophthalmology Department, AL-Zahraa University Hospital. The study was performed from December 2018 to August 2019. Retinal diseases (20.2%) were the most common eye diseases among the studied group followed by errors of refraction (19.6%), cataract (19.4%), dry eye (12.8%) and intravitreal injection (6.4%). There was a significant difference between male and female population regarding ocular trauma and different eye diseases. Also, there was a significant difference between occupation groups regarding diagnosis of different eye diseases and between age groups regarding diagnosis of different eye diseases⁽¹⁸⁾. Regarding conjunctivitis, Mucopurulent conjunctivitis is the most common type of conjunctivitis (74%), then Allergic conjunctivitis (12%) with statistically significant difference. Allergic conjunctivitis was found among 8.1% of a studied group of rural residents aged up to 20 years⁽¹⁹⁾. In American study, the prevalence of eye infections in private school children is less than that in public schools⁽²⁰⁾. In the current study, eye lid diseases represent 11.2% and chalazion is the most common type of eyelid diseases (46%), then Nasolacrimal duct obstruction (23%). This is higher than another study in Egypt that found that eye lid diseases represent 2.8%⁽⁵⁾.

Conclusion

In conclusion, 62% of children had visual impairment due to refractive error, especially myopia. Correction of these errors proved to be very effective. Visual problems in young children are often undetected, thus rendering correction of errors and other causes of visual impairment indispensable in their positive impact on education and quality of life. Increasing community awareness and provision of

health services are of the utmost importance. However, the unavailability of testing services, and the inability to make use of such services due to socioeconomic factors and cultural deterrents still present obstacles and are a cause of lack of compliance. Public health activities, including work by the Research Institute of Ophthalmology community outreach programs to improve surveillance and the delivery of vision screening within primary care settings, and state and local efforts to provide screening within the community, are central to decreasing the long-term morbidity associated with blinding eye diseases.

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