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Epidemiological Trends of Pediatric Eye Diseases in Iraq: A Cross-Sectional Study

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Abstract: Background: The most common cause of non-congenital unilateral blindness and monocular vision impairment in children is ocular trauma.

Aim: This study identifies epidemiology and ocular trauma related to pediatrics in Iraq.

Study design: A cross-sectional study was conducted on 120 Iraqi pediatric patients hospitalized with ocular injuries in the ophthalmology department in Baghdad, Iraq, during the period February 2023 - November 2024.

Outcomes: Our findings showed that patients with ages (5–8) years had 50% eyes, sides included, right with 55%, left with 42.5%, and both with 2.5%; an open globe wound had 55%, a close globe wound had 35%, and almost all children got eye injuries in street with 27.5% and school with 15%, where 45% had undergone ocular wall repair and 25% had undergone lens extraction, where all patients got visual acuity with > 0.3, and ocular trauma scores (41–80) were 70%.

Conclusions: Home-occurring open globe wounds are prioritized for preventative measures. To figure out which children are most at risk, prospective studies with a variety of populations and standard outcome measures are necessary.

Keywords: Epidemiology; Ocular trauma; Complications; Visual acuity; ocular trauma scores (OTS); and Pediatric.

I. INTRODUCTION

The most common cause of non-congenital unilateral blindness and monocular vision impairment in children is ocular trauma ***[1,2].*** The global epidemic of eye injuries for children, which has a prevalence of 0.746, up 9.9 per 10,000 in the US and other industrialized nations, has drawn more attention in recent years. ***[3,4,5,6]***

According to population-based research on juvenile ocular trauma, men constitute around two-thirds of wounded patients, and most of them have closed-globe injuries sustained at home ***[7,8,9,10].*** However, open globe injuries are the primary cause of vision impairment when research participants are limited to eye injuries diagnosed in any healthcare facility, including tertiary institutions. ***[11]***

Because wounded children's eyes are more likely to develop amblyopia, pediatric ocular trauma represents a unique problem. From the standpoint of general health and injury prevention, identifying the incidence and range of these injuries in a certain population, as well as focusing on legislative and educational initiatives, might be the means of reducing eye injuries. ***[12,13]***

In contrast to previous studies ***[14,15,16],*** a comprehensive analysis of people hospitalized for orbital and ocular trauma across all age groups within the Chanshan region revealed that 23.6% of those hospitalized with eye injuries during the most recent 10-year period were in the 0–14 age range. In addition, there is little data on the financial impact of pediatric eye injury hospitalizations in China to compare with data from other nations, such as the US.

II. IIMETHODOLOGY

We conducted a cross-sectional study of 120 pediatric patients with eye injuries in Iraq, aged 1-12 years. Socio-demographic data were recorded for the pediatric patients during the 12-month follow-up period, with 60% males and 40% females. Demographic data of the patients were determined in terms of age, gender, eye side, duration of follow-up, and the social and professional status of the parents of the children.

For admission and discharge parameters, 1) patients aged 1-12 years, 2) children admitted to the emergency department of the ophthalmology department in Baghdad hospitals, Iraq, 3) children without comorbidities, 4) children with only eye injuries were included, while 1) patients older than 12 years and younger than 1 year, 2) patients with previous surgeries, 3) patients with no medical history from parents, and 4) patients with genetic eye defects were excluded.

Our study identified the diagnostic data of pediatric patients, which were distributed to both males and females, where we identified the causes that resulted in eye injuries, which are (open spherical wound, closed spherical wound, chemical burn to the eyeball and its appendages, thermal burn to the eyeball and its appendages, fractures in the eye wall, tear apparatus, and eyelid rupture, and other parameters). Our diagnosis was determined in identifying the sites of injury in children, which all resulted from motor actions and were not genetic, and most of them occurred at home, in streets, parks, schools, sports fields, amusement parks, and other places).

As a result, surgical interventions were performed on all children, which were divided into (eye wall repair, lens extraction, vitrectomy, anterior chamber washout, and canalicular anastomosis). The data included patients during surgical interventions in terms of length of hospital stay, number of cases that were exposed to bleeding, admission to the intensive care unit, and mortality rate. All patients underwent the Ocular Trauma Scale (OTS), which measures the degree of improvement in visual outcomes in patients with eye injuries. The scale ranges from 0 to 100, with 0 representing poor visual acuity and 100 representing optimal visual acuity.

III. RESULTS

TABLE 1. BASELINE CHARACTERISTICS OF PATIENTS IN BOTH EYES INJURIES.

Variables	Children, 120	%
Age categories, years		
1 – 4	24	20%
5 – 8	60	50%
9 - 12	36	30%
Gender		
Male	72	60%

Female	48	40%
Eyes sides		
Right	66	55%
Left	51	42.5%
Both	3	2.5%
Marital status		
Married	78	65%
Divorced	24	20%
Widow	18	15%
Occupation status		
Housewife	90	75%
Employed	30	25%
Follow–up cumulative period (months)	11.31 ± 1.54	

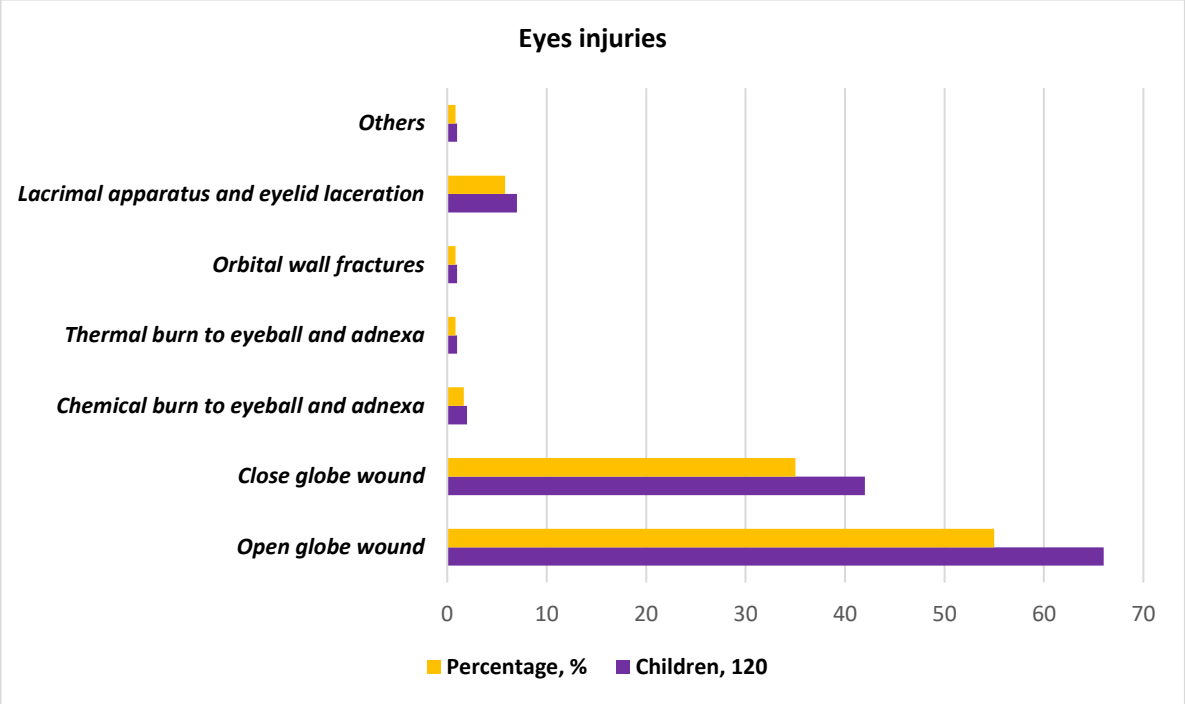

FIGURE 1. DETERMINING TYPES OF EYE INJURIES FOR CHILDREN.

TABLE 2. IDENTIFY LOCATIONS OF EYES INJURIES IN RELATED WITH TYPES.

Places	Children, 120	%
Home	17	14.17%
Street	33	27.50%
Parks	14	11.67%
School	18	15.00%
Sports field	17	14.17%
Amusement Park	10	8.33%
Other Places	11	9.17%

TABLE 3. A CORRELATION OF EYES INJURIES WITH THE GENDER OF CHILDREN.

Eyes injuries	Males		Females	
	N = 72	*%*	*N = 48*	*%*
Open globe wound	34	28.33%	27	22.5%
Close globe wound	30	25%	12	10%
Chemical burn to eyeball and adnexa	1	0.83%	1	0.83%
Thermal burn to eyeball and adnexa	1	0.83%	1	0.83%
Orbital wall fractures	2	1.67%	1	0.83%
Lacrimal apparatus and eyelid laceration	3	2.5%	1	0.83%
Others	1	0.83%	4	3.33%

TABLE 4. SURGICAL INTERVENTION TYPES.

Types	Number of patients: 120	%
Ocular wall repair	54	45%
Lens extraction	30	25%
Vitrectomy	12	10%
Anterior chamber washout	6	5%
Canalicular anastomosis	18	15%

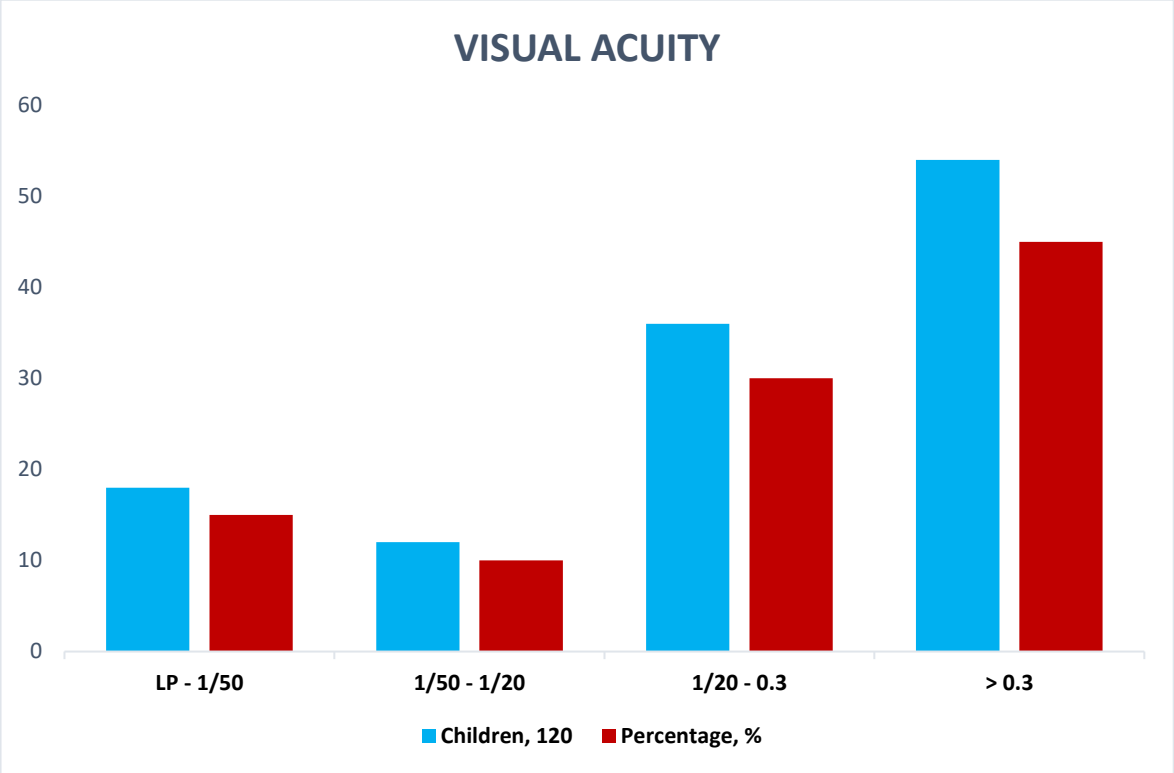

FIGURE 2. MEAUREMENT OF VISUAL ACUITY SCORES OF CHILDREN AFTER SURGICAL INTERVENTIONS.

TABLE 5. IDENTIFICATION OF OCULAR TRAUMA SCORE (OTS) AT CHILDREN IN POST – POST-INTERVENTION.

Ocular Trauma Score	Number of children: 120	%
0 – 40	6	5%
41 – 80	84	70%
81 - 100	30	25%

TABLE 6. MEDICAL CARE OF HOSPITAL WITHIN CHILDREN.

Surgical data	Males, 72		Females, 48	
Length of stay in hospital				
< 8	33	45.83%	8	16.67%
> 8	39	54.17%	40	83.33%
No of bleeding				
Yes	12	16.67%	15	31.25%
No	60	83.33%	33	68.75%
ICU admission				
Yes	17	23.61%	12	25.0%
No	55	76.39%	36	75.0%

III. DISCUSSION

The yearly hospitalization rate of pediatric eye injuries has been calculated by this study to be 0.37 per 10,000, that is lower than the rate documented in the US ***[17].*** The lack of polytraumatized cases and patients with mild trauma who may have sought treatment for their eye injuries at hospitals beyond the ones under study may have contributed to the underestimation of the real prevalence of ocular trauma. ***[18]***

The present study's findings are consistent in previous studies conducted in different countries that showed a preponderance of male youngsters under the age of nine. This might be read as indicating that primary school students are more vulnerable compared to the preschool-aged group because, despite their relative immaturity, they are a little more autonomous. Notably, the roadway accounted for 27.5% of the total accidents in the present investigation, being the most frequent location for injury incidence.

In addition, compared to most prior studies ***[19,20],*** where closed globe wounds showed the largest proportion, children under the age of nine years had a greater risk of hospitalization in open globe wounds (28.33 percent for boys and 22.5 percent for females). The variations of the data reflection might be caused by a variety of reasons. Compared to children treated in other settings, hospitalized children may have more serious injuries.

[20,21,22,23] Some studies suggest that the industrialized country's significantly lower incidence rates of sports-related and occupational injuries demonstrate the success of a combination of adequate education and legislation.

In our study, a high OTS and strong establishing vision were statistically associated with good final vision, like earlier investigations have clearly demonstrated. Despite improvements in treatment, children's visual prognoses are still poorer than those of adults due to the nature of their injuries and amblyopic issues. In this study, a total of 8 eyes (6.45%) had orbital wall fractures, eyelid lacerations, lacrimal apparatus injuries, or other non-eyeball structures. Lacerations of the eyelids frequently occur alongside other face injuries. ***[24]***

Due to the early construction of the orbital bones, children are more susceptible than adults to experience orbital fractures that require surgical correction sooner and result in entrapment of orbital contents ***[25].*** More severe orbital injuries led to major permanent vision loss and severe neurologic impairment from additional head traumas, proving that ocular trauma necessitates a neurosurgical treatment. **[26]**

V. CONCLUSION

We concluded that one of the main causes of vision impairment in this juvenile cohort was ocular trauma. Due to the increased likelihood in surgery, long-term vision impairments or blindness, and associated developmental delays, open-globe wounds have a worse visual prognosis versus closed-globe wounds.

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