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REVIEW

The Burden of Assessing Ocular Status of Children – Causes and Control

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ABSTRACT

Pediatric ocular diseases can be detectable through a comprehensive eye examination and most of them are preventable once they are discovered. There is a well known fact that children can have ocular pathology such as cataract, refractive errors, strabismus and amblyopia. In children, low vision can have a negative impact on their growth and development; therefore, any visual impairment must be detected as soon as possible to prevent amblyopia development.

Keywords: visual impairment, refractive error, children, Down syndrome, autism, ADHD, deafness.

OBJECTIVES

The younger the age a visual problem is discovered, the more favorable the improvement of the function. It is very important to diagnose and treat ocular conditions such as refractive errors, cataract and strabismus in children; moreover, a visual screening is recommended before a child reaches the age of six. The base for vision is represented by fixation (1). Sight is a basic term of education and profession, and therefore, its periodical assessment is useful and recommended (2, 3).

Ii is estimated that worldwide, 15 million of children below the age of 16 bear a visual handicap secondary to an uncorrected refractive problem (4). A child with a reduced visual acuity is not aware of the best visual acuity and cannot express difficulties related with the vision. A review of the literature revealed that many studies have been conducted on the epidemiology of ocular disorders since 1990, showing that most common ocular problems in children were refractive errors (5).

Children with low vision are often neglected and these problems have a prevalence of twenty times higher in special needs children compared to those clinically healthy (6). Visual screening programmes of children with special needs are frequently covering only refractive errors (REs), while other ocular disorders are not well studied

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(7, 8) because the focus is maintained on other aspects of their health and management (9).

Disability is one of the ultimate problems among non-comunicable diseases and is recognized as a neglected public-health issue (10). The higher prevalence of ocular disorders among children with special needs is due to the primary causes of their disabilities (11). Thus, visual problems are common in preterm born children, in those with genetic systemic disorders such as Down syndrome, deafness, and even among those with ADHD and autism (11). A low vision in childhood will lead to inadequate emotional and social development of the child (12). Visual deficiency and ocular problems are the most debilitant medical conditions a person can have. Earlier detection of a visual impaired condition is essential for intervention and prevention of amblyopia (13).

Pathology that affects the visual system of children with disabilities is displayed below.

Congenital anomalies

Ocular anomalies in which the eyeball is absent or smaller than normal at birth are called anophthalmos and microphthalmos. One of the most common congenital anomalies is uveal coloboma. It is a type of anomaly secondary to the incomplete closure of the embryonic fissure. Many surveys showed that these anomalies can lead to visual impairment in children (14). Congenital anomalies can be sometimes difficult to assess before the birth of a child (15).

Amblyopia

Amblyopia has a significance of low vision that cannot be corrected with glasses, being the most prevalent ocular disorder among people under the age of 40. The main causes of amblyopia are refractive errors, strabismus and media opacities (16). Most of the cases are unilateral, but some of them are bilateral. This pathology is preventable and its treatment is effective during early childhood (17, 18).

Strabismus

Strabismus is a condition where one eye or both eyes has/have a misalignment either permanently or occasionally. Esotropia is one of the most frequent type of strabismus in children, with a prevalence of 1-2% below the age of 6 (19, 20). Long-term strabismus is less likely to have a positive success rate of treatment, but this also depends on the associated conditions (21).

Refractive errors

Refractive error status of the eyes undergo multiple changes in first years of life. This ocular pathology include myopia, hyperopia and astigmatism and has the highest prevalence in preschool children. Earlier detection and effective treatment of refractive errors can prevent amblyopia as well as strabismus. As mentioned in different studies, the prevalence of myopia ranges from 0.8% in Laos (22) to 86.5% in children aged 6-11 from China (23).

Worldwide, about 15% of children are hyperopes (23) and the prevalence of astigmatism varies from 0.3% in Thailand (24) to 91.9% in Africa (25).

Ophthalmic disease

Ocular disorders are isolated or associated with different systemic conditions. Different ocular diseases include anomalies (microphthalmia, coloboma and aniridia), retinal and optic nerve anomalies (retinopathy of prematurity, optic atrophy, congenital nystagmus and retinoblastoma) (26) and media opacities (cataract). The pevalence of cataract at birth is 4-5/1 000 births (26) and in many cases, the cause is unknown. Its importance is increasing because of the secondary blindness it leads to. These anomalies are most frequently seen in certain groups like those with Down syndrome (27, 28), deafness (29), ADHD and autism (30). Retinoblastoma is the most frequent malignant tumor in children and is discovered as a leukocoria, esotropia or masquerades uveitis (31).

Color vision deficiency

Abnormal color vision includes red-green deficiencies with a prevalence of 1.2% in males an 0.5% in females. Spotting a color vision deficiency during childhood is important because it may guide the ophthalmologist for a specific pathology. The prevalence of this patology is higher in special needs children and nowadays, its detection is crucial for preventing vision loss and visual impairment in children (32).

An early detection of visually impaired children is vital for a proper intervention and also for prevention of amblyopia because the visual pathways are the most active in childhood, so that early treatment in ophthamic pathologies will help children reach their goals lately in life (32). ❑

CONCLUSION

Ophthalmic evaluation of a child may be challenging, but ophthalmologists should have a look at the cornea, anterior chamber status, pupillary refelx and lens. The red reflex should be investigated to rule out a leukocoria and other causes for a leukocoria. If the child does not cooperate, examination should be repeated after a few days.

A visually impaired child should be treated promptly, because visual deprivation can lead to amblyopia, which is difficult to treat. Pediatricians and all practitioners working with children should be educated to detect an opacity seen into the eyes of a child.

Visually impaired children can be detected and diagnosed and they can benefit of special eye care, so that amblyopia should not develop. ❑

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