ORIGINAL ARTICLE

Importance of the ophthalmological evaluation in newborns

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Abstract

Objective: to verify the existence of ocular diseases in the first 48 hours of life of newborns and relate it to the clinical suspicious of pediatricians.

Methods: a prospective study was performed. All infants that were born between July and December of 2000 were evaluated in the nursery of Hospital Universitário Evangélico de Curitiba (HUEC). Six hundred sixty-seven newborns were evaluated through a protocol by residents and tutors of ophthalmology, regardless of pediatricians’ suspicious of ocular disorder. The examination consisted of inspection, oblique illumination, evaluation of ocular deviation and direct ophthalmoscopy (red reflex) in all patients.

Results: among all examined newborns, 3.75% showed some ocular disease. The most frequent problem was corneal opacity. The ocular diseases were not noticed by pediatricians, neonatologists and parents in fifty-six per cent of the cases presenting some problem.

Conclusions: this study showed that many ocular disorders presented at birth are not noticed by pediatricians (56%), which highlights the importance of ophthalmological evaluation in all newborns as a routine examination in the first 48 hours of life.


Introduction

Pediatric ophthalmology does not involve only the treatment of eye diseases in children, but it is also concerned with the effects of such diseases on the immature visual system of these patients.1

Several eye infections, some of which present a high rate of morbidity and mortality, show their first clinical symptoms in the first days or within the first hours of life. However, simple and also severe eye disorders can go unnoticed by pediatricians, neonatologists, and parents. Leukocoria (white pupil), one of the most evident clinical signs, has different and often severe etiologies, such as congenital cataract, persistent hyperplastic primary vitreous, retinopathy of prematurity, among others. If these conditions are not early diagnosed and treated, they may contribute towards a poor prognosis.1

Harmless-looking eye disorders can also cause amblyopia (reduced visual acuity), which is usually unilateral
and affects visually immature infants due to the lack of a sharp image in the retina,\(^2\) as in congenital strabismus.\(^3\)

The aim of this study was to assess the existence of ophthalmologic alterations in newborns and to associate them with pediatricians clinical suspicion.

**Patients and Methods**

Between July and December 2000, 667 newborns were evaluated at Hospital Universitário Evangélico de Curitiba (HUEC). A protocol including the following information was used: newborn’s age, gestational age, birthweight, type of delivery, pathologies and medications during pregnancy, assessment of ocular deviation, oblique illumination test, light reflex examination, and direct ophthalmoscopy (red reflex). Red reflex is the reddish retinal reflex, which is detected by looking through the ophthalmoscope and shining the light into the patient’s eye, provided that the ocular media (cornea, aqueous humor, lens and vitreous humor) are transparent.

The inclusion criteria were full-term, healthy newborn infants born between July 1st and December 1st, 2000, RNs, placed in the rooming-in facilities in the first 48 hours of life. The exclusion criteria were presence of any kind of congenital malformation and birth conditions.

The newborns were examined within the first 48 hours of life at the rooming-in facilities by resident doctors, who were supervised by ophthalmology professors of HUEC. Those newborns who showed ophthalmic abnormalities were submitted to a thorough ophthalmic examination (tonometry, indirect ophthalmoscopy with pupil dilation) at the Ophthalmologic Outpatient Clinic. The assessment was carried out individually if ophthalmic abnormalities were suspected.

This study was approved by the Research Ethics Committee of HUEC.

**Results**

Twenty-five of 667 newborns (3.75%) presented ophthalmic abnormalities, which were later confirmed by the thorough ophthalmic examination. The remaining patients did not show ophthalmic abnormalities on examination.

The most commonly observed ophthalmic disorders were: corneal opacities – 8 cases (32%), convergent deviation – 6 cases (24%), neonatal conjunctivitis – 5 cases (20%), subconjunctival hemorrhage – 2 cases (8%), unilateral congenital cataract – 2 cases (8%), anisocoria – 1 case (4%), iris and choroid coloboma – 1 case (4%) (Figure 1).

All the cases of corneal opacity apparently originated from delivery trauma. No case of conjunctivitis required collection of material before treatment onset. The etiologic diagnosis of the infection could not be determined. All newborns with abnormal results on the first examination were submitted to a second ophthalmologic examination for confirmation.

Among those infants who presented ophthalmic alterations on the first examination, the pediatricians failed to identify abnormalities in 14 (56%). These 14 infants showed corneal opacity (five cases), convergent strabismus (three), neonatal conjunctivitis (two), congenital cataract (two), anisocoria (one), and iris and choroid coloboma (one).

![Figure 1](Image) - Frequency of ocular problems
Discussion

The major difference between pediatric and adult ophthalmology lies in the impact that the disorders may have on children’s visual development. Recent research has shown that an early ophthalmologic evaluation allows newborns to have a better visual development. According to von Noorden, 2 to 4% of American children have amblyopia, usually caused by anisometropia (different refractive error on each eye) and strabismus. According to Ehrlich et al., approximately 80% of school-age children in the United States are not screened for ophthalmic disorders. Such an inadequate preventive medicine is unfounded, since the screening tests are costless, easy to perform and non-time consuming. A standardized evaluation should be added to the examination of apparently healthy children so that treatment, if necessary, can be early implemented.

Amblyopia and strabismus are common pediatric diseases and, if not early detected, they can cause binocular visual loss and even functional blindness. Congenital cataract and glaucoma are rare, but may cause significant visual loss if not immediately treated. Untreated retinoblastoma, may cause blindness and be fatal. All of these diseases can be controlled or potentially cured if they are early detected.

The development of leukocoria in persistent hyperplastic primary vitreous occurs very early (at birth), and should be included in the differential diagnosis.

Leukocoria is a clinical sign that indicates the opacity of the lens and/or of the posterior eye segment (vitreous and retina). As a result, the pupil becomes whitish and does not allow the red reflex to be viewed.

Corneal opacity consists of the reduction of the total transparency of the cornea due to a lesion in one or more corneal layers. In case of birth trauma, the cornea decompensates due to a rupture in Descemét’s membrane.

Some studies show a higher risk for retinopathy, strabismus and amblyopia in newborns, especially those with low weight, especially those with low weight.

The American Association for Pediatric Ophthalmology and Strabismus and the American Academy of Pediatrics recommend that the ophthalmologic evaluation of newborns (both preterm and term) include the red reflex test (by means of direct ophthalmoscopy), inspection, pupillary response and detection of ocular deviation. They also mandate that such evaluation be used for all infants weighing less than 1,500 grams at birth and for all those with family history of ophthalmic abnormalities, such as congenital cataract and retinoblastoma, since 60% of these infants have leukocoria.

This study shows that the ophthalmologic evaluation in the first 48 hours of life should also be used for apparently healthy newborns. This evaluation can be performed by any qualified member of the medical staff, including nursing assistants and technicians.

In agreement with the literature, this study, only 44% of the newborns with ophthalmic disorders were evaluated, as requested by the medical staff.

The study revealed that 56% of ophthalmic disorders observed at birth had not been identified by neonatologists and pediatricians. This shows the importance of using an ophthalmologic evaluation as a routine procedure when examining newborns. Since the first evaluation can be easily performed by any member of the medical staff, the fact that it is not performed can be deemed negligence, and might severely compromise patient’s life in the future.

References


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