

# Role of Paediatricians in Paediatric Ophthalmology

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## Introduction

Paediatricians primarily examine children. Paediatric ophthalmology is the subspecialty in ophthalmology that deals with eye diseases in children. Paediatricians can be the key personnel for early referral of the children with common avoidable causes of childhood blindness diseases to a paediatric ophthalmologist.

The common avoidable causes of childhood blindness are refractive errors, amblyopia, ROP, VAD, xerophthalmia, ophthalmia neonatorum, congenital cataract, and retinoblastoma<sup>1</sup>. In Nepal, most of the people in the community are illiterate<sup>2</sup>. There is lack of health education and health care facilities. People are reluctant to seek medical advice for the health problems. Eye health gets the minimal importance. Children's health regarding the eyes is of a least priority.

## Refractive Error

Refractive error occurs due to the unfocused image on the retina. Myopia (nearsightedness), hyperopia (farsightedness) and astigmatism (distorted vision) are the different types of refractive errors. Children have difficulty seeing clearly or in high hyperopia strabismus may also be present. Refractive errors are possible to correct by simple use of glasses since early childhood.

## Amblyopia

Amblyopia (lazy eye) is unilateral or bilateral reduction of best-corrected visual acuity that cannot only or be directly attributed to the effect of a structural abnormality of the eye or the visual pathways. It is a diagnosis of exclusion. Amblyopia is caused by abnormal visual experience early in life resulting from strabismus, anisometropia or high bilateral refractive errors (isometropia) or stimulation visual deprivation.

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## Abstract

Children are primarily examined by paediatricians. In Nepal, child health is in low priority due to illiteracy, there is total lack of awareness about children's eye health. The common avoidable causes of childhood blindness are refractive errors, amblyopia, retinopathy of prematurity (ROP), vitamin A deficiency (VAD), xerophthalmia, ophthalmia neonatorum (ON), congenital cataract, and retinoblastoma. Paediatricians could be the key persons for early referral of these children to a paediatric ophthalmologist. Paediatricians can send the patients for eye examination after birth within 6 weeks, at 6 months, at one year and before going to school. In conclusion, early screening and referral by the paediatricians to the paediatric ophthalmologist prevents children from being sightless.

**Key words:** Paediatric ophthalmology, Refractive error, Vitamin A deficiency

With timely intervention, the reduction in visual acuity caused by amblyopia can be completely or partially reversed<sup>3</sup>. Amblyopia can be treated by glasses, patching or surgery in case of stimulation deprivation amblyopia.

## Antenatal care and TORCH infections

Children's eye health care commences from the time of gestation. If mothers were exposed to prenatal TORCH infections, it could lead to strabismus, congenital cataract and macular scars<sup>4</sup>. Antenatal care is very important in maternal and child health. During the first trimester, fever and rashes can be due to Toxoplasmosis, Rubella, Cytomegalovirus, Herpes and other infections like human immunodeficiency virus (TORCH) infections. The eye health care professionals should educate the other health professionals and the community, that maternal TORCH infections can cause the eye problems like congenital cataract in the children. This information is very important for mother group.

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### Retinopathy of Prematurity (ROP)

ROP occurs in the pre-term (born before 31 weeks of gestation) and low birth weight babies (less than 1500 grams). Early referral of these children is important to rule out ROP<sup>5</sup>. The most important factor in the pathogenesis of the ROP is prematurity and low birth weight. Other factors like sepsis, frequent blood transfusion, apnea and any problem with oxygenation are also implicated in the aetiology of ROP. Any neonate with less than 1500 grams birth weight or less than 31 weeks of gestation needs the screening. ROP causes strabismus, congenital cataract, vitreous hemorrhage and retinal detachment in children.

Paediatricians should request the paediatric ophthalmologists to examine the children's eye in the neonatology unit<sup>6</sup>. For babies born before 28 weeks, the first eye examination is done at 4 weeks postnatal age or at 32 weeks post-conceptual age, whichever is earlier. Babies born after 28 weeks of gestation are examined 2-3 weeks after birth.

### Vitamin A Deficiency (VAD)

VAD is estimated to affect approximately one third of children under the age of five around the world<sup>7</sup>. Breast milk contains vitamin A. Vitamin A prevents xerophthalmia and night blindness in children. Most of the mothers are unaware about it. This simple message from paediatrician will prevent blindness in children from VAD. Measles also causes VAD related corneal ulcer and perforation in children. Hence measles vaccination is important.

### Vitamin A schedule

In areas where there is a serious problem of VAD, the first dose of vitamin A is given as soon as a child with measles is seen. The dose of vitamin A supplement for children with measles, immediately on diagnosis, should be 100 000 IU, by mouth, for children 6-12 months of age, and 200 000 IU for children above the age of one year. Measles is rare under the age of six months, but such young children may be given 50 000 IU vitamin A. A second dose of vitamin A should be given the following day. If any of the eye signs of vitamin A deficiency are

present, a third dose of vitamin A should be given 2-4 weeks later<sup>8</sup>.

### Ophthalmia Neonatorum (ON)

ON is defined as any neonatal conjunctivitis with discharge from the eyes during the first 28 days of life, which if untreated, progresses to corneal perforation and blindness<sup>9</sup>. Its etiology may be gonococcal or nongonococcal. Paediatrician can refer the neonates with ON to pediatric ophthalmologist. This can prevent blindness by frequent administration of fortified topical antibiotic and single injection of ceftriaxone 50 mg/kg IM or IV for one week.

### Leukocoria

Children with strabismus and visible whiteness of the pupil (cat's eye reflex), also known as leukocoria, may be due to congenital cataract or retinoblastoma<sup>10</sup>.

### Pediatric Cataract

Paediatric cataract is the opacity of lens and the capsule in the paediatric age group. The management of the paediatric cataract is surgery. The surgical method is lens aspiration with or without anterior vitrectomy, and with or without intra-ocular lens implantation. The earlier the surgery better is the visual prognosis<sup>11</sup>.

### Retinoblastoma

Retinoblastoma is the most common intraocular malignancy in childhood. Surgery and chemotherapy is the management for retinoblastoma. Community people are unaware about the possibility of tumors in children. They hardly know about the tumors in the eyes of children. If they are informed about it, early referral and treatment will save child's eyes and life. Initially nearly all cases were fatal. However, advances in diagnosis and treatment have resulted in a present survival rate of nearly 95%. Early detection of retinoblastoma combined with improved treatment modalities has been an important factor in the reduction of morbidity and mortality. Mothers need to know that white pupillary reflex is abnormal. They should be informed that it may be due to congenital cataract or retinoblastoma<sup>12</sup>.

**Table 1:** Vitamin A schedule

Age	Immediately on diagnosis	Next day	2-4 weeks later (if eye signs)
Infants less than 6 months	50 000 IU	50000mIU	50 000 IU
Infants aged 6-11 months	100 000 IU	100 000 IU	100 000 IU
Children aged 12 months and over	200 000 IU	200 000 IU	200 000 IU

Note: Vitamin A capsules

200,000 IU =60,000 mcg= 60 mg retinol palmitate/acetate in oily solution

100 000 IU =30 mg retinol palmitate/ acetate

50 000 IU=15 mg retinol retinol palmitate/acetate

According to The American Academy of Ophthalmology and the American Association for Paediatric Ophthalmology and Strabismus it is essential to check children's vision. **Red reflex test should be done in newborn.** A second screening for eye health should be done during infancy between six months and the first birthday. **For preschooler,** between the ages of 3 and 3½, a child's vision and eye alignment should be assessed. Then finally when children go to school, paediatrician should refer the children to paediatric ophthalmologists.

### Conclusion

Good visual acuity is one of the important factors for the child's physical development. Paediatric ophthalmologists can diagnose any problem of poor vision in children. If diagnosed early it can be treated promptly. Paediatricians can send the patients for eye examination after birth within 6 weeks, at 6 months, at one year and before going to school. In conclusion, early screening and referral by the paediatricians to paediatric ophthalmologist prevents one child from being blind.

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