CONTINUING MEDICAL EDUCATION

NYCTALOPIA

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Nyctalopia, diminished vision in dark, is not uncommon in the pediatric age group. The causes of night blindness (*Table I*) are varied(1); some of these are stationary. Of the progressive causes, some have only eye abnormalities, while others have associated systemic features.

The full work up of a patient with nyctalopia requires a clinical ophthalmic work up, electrophysiological tests including electroretinogram (ERG) and electro-oculogram (EOG), dark adaptometry and a detailed systemic examination.

The purpose of this communication is to make the clinician aware of causes of *treatable nyctalopia*. It is important to suspect them and have a detailed ophthalmic evaluation done so that the disease can be arrested in early stages.

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Vitamin A deficiency is the most common and preventable cause of night blindness in children, its reported prevalence in various surveys in preschool children ranges from 0.7 to 8.6%. Vitamin A deficiency may be primary or secondary. Various childhood diseases adversely affect vitamin A status: malnutrition, gastroenteritis and chronic intestinal parasitic infestations (reduced absorption of vitamin A and carotenoids and impaired recycling of binary conjugates of vitamin A), and acute infections like measles, pneumonia, whooping cough (increased rate of vitamin A metabolism)(1).

Most human vitamin A deficiency is not due to the lack of available nutrients, but rather poor feeding habits. Breast-fed infants do not suffer from acute vitamin A deficiency despite the relatively low concentration of vitamin A (<20 μg retinal/dl) in human milk. The problem usually starts at weaning with gradual exhaustion of hepatic reserves of Vitamin A particularly when Vitamin A poor foods, such as gruels of rice and cassava, replace the more nutritious breast milk in the diet. The long term solution therefore lies in cultural and attitudinal changes. Under the National Program for Control of Vitamin A deficiency, later incorporated into the National Program for the Control of Blindness and Prevention of Visual Handicap, all children in the age group 0-5 years, receive 2 lac IU of Vitamin A orally every six months.

Impaired dark adaptation is thought to be the earliest manifestation of vitamin A

TABLE—*Causes of Nyctalopia*

A. Acquired : Vitamin A deficiency

B. Hereditary :

I. Stationary

1. Congenital stationary night blindness
2. Oguchi's disease
3. Fundus albipunctatus

II. Progressive

1. Retinitis pigmentosa (RP)—Classical
2. Variants of RP
   (*a*) Sector retinitis pigmentosa
   (*b*) Unilateral retinitis pigmentosa
   (*c*) Inverse retinitis pigmentosa
   (*d*) Retintis pigmentosa sine pigmento
3. RP associated with syndromes
   (*a*) Laurence-Moon Bardet-Biedl syndrome (LMBB)
   (*b*) Refsum's syndrome
   (*c*) Bassen-Kornzweig syndrome
   (*d*) Usher's syndrome
   (*e*) Retinitis punctata albescens
   (*f*) Leber's congenital amaurosis
   (*g*) Choroideremia
   (*h*) Gyrate atrophy of the choroid and retina
4. Favre-Goldmann syndrome

deficiency, representing the subclinical form of xerophthalmia, and is more prevalent in older children. At this stage there may be no other clinical evidence of deficiency (conjunctival or corneal xerosis, Bitot spots, *etc.*), so it is often missed. Characteristic fundal changes described but rarely seen are small, discrete, yellowish-white dots deep to the vessels in the equitorial or peripheral zone. The changes disappear completely within 1-3 months of Vitamin A therapy. Definite recommendations for simple night blindness due to Vitamin A deficiency are hard to find: in our center we have found a stat oral dose of 2 lac IU adequate for all grades of deficiency except keratomalacia. This dose should be repeated after 6 months.

Amongst other causes of treatable nyctalopia, dietary restriction of sources of phytol and phytanic acid can retard the development of retinal abnormalities in Refsum's disease, and massive doses of Vitamin A can reverse abnormalities of dark adaptation in Bassen-Kornzweig syndrome(2). A low protein diet with massive doses of Vitamin B_6 (pyridoxine) normalizes plasma and urinary ornithinine levels in gyrate atrophy and may also have a beneficial effect on ocular changes if instituted early(3).

The importance of knowing these causes of nyctalopia is: (*i*) Some of these conditions are treatable and in others, if detected early, further worsening of the disease can be arrested. (*ii*) Confirmatory diagnosis of other conditions helps in giving proper occasional guidance to the child and parents. (*iii*) Full family work up is important as many of the causes of nyctalopia are hereditary.

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