MYOPIA OF PREMATURITY: A MISSED OPPORTUNITY

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Preterm babies are defined as babies born before 37 weeks of pregnancy. About 15 million preterm babies are born every year and 1 million children die each year due to complications related to preterm birth.[1] Globally, prematurity is the leading cause of mortality in children under the age of 5 years. Many babies who survive, face lifetime of disabilities like learning disability, visual and hearing problems. Due to recent advances in neonatal care, survival of preterm babies has improved drastically. However, this has also opened a Pandora's Box of challenges.

It is well documented that refractive disorders such as myopia, anisometropia and astigmatism, are common in preterm infants. World Health Organization (WHO) classified Myopia as one of the leading causes of blindness and visual impairment in the world today.[2] The prevalence of myopia varies, depending on age at examination, family history,[3,4] ethnicity,[3] and occupation.[5] Genetic factors, environmental factors, premature birth, and retinopathy of prematurity (ROP) are well known to be associated with the development of a specific form of myopia.

According to Chen et. al., "The most important predictors for refractive outcomes are optical components such as anterior chamber depth, lens thickness, and axial length. Gestational Age (GA), Birth Body Weight (BBW), and some postnatal diseases exert their effects on refractive status mainly through indirectly affecting optical components."[6] Many cross-sectional studies have revealed that premature babies as compared to full-term infants are more prone to development of myopia from an early age and may remain myopic later on in childhood and adolescence. This is known as myopia of prematurity (MOP),[7-12] and it can continue to increase up to the age of 2 years.[13,14]

Fielder and Quinn[15] classified myopia associated with premature birth into three types: (1) physiologic myopia; (2) myopia with preterm birth; and (3) myopia induced by ROP. The prevalence of these specific types of myopia varies and likely depends on the preterm birth, such as low birth body weight (BBW) and small gestational age (GA) at birth, the severity of ROP, and emmetropization in early infancy. The biometric components that have been shown to contribute to this refractive error include a shallower ACD,[16] increased lens power,[12] increased CC,[16] and a shorter overall AL than would be expected for the dioptric value of the eye.[16] Later on, reports of increased PSL are noted. It seems that the early effect of growth restriction associated with ROP is followed later by a deregulation of ocular growth within the posterior segment.

The most comprehensive prospective data came from the Early Treatment for Retinopathy of Prematurity (ETROP) study and Cryotherapy for Retinopathy of Prematurity (CRYO-ROP) study[14, 17]. These studies have found that preterm infants with severe ROP exhibit significant refractive errors at a higher frequency than those with mild ROP and without ROP. The risk of myopia at 12 months of age doubles with each increasing stage of the disease, birth weight of less than 751 gram leads to a threefold increase in the risk of developing myopia. In eyes randomized to no treatment overall incidence of myopia was 21% at 1 year, falling to 16% at 4.5 years of age. The incidence of myopia in eyes with stage 0 disease was found to be 10%; in eyes with spontaneously regressed ROP, 20%; and in eyes with severe ROP and sequelae, 80%. Fledelius also contributed much to our knowledge of about the association between myopia and ROP and its treatment [8,10,16]. The incidence of myopia ranges from 1% to 16% in eyes with stage 0 disease.[14,18,19] If mild ROP is present, this incidence ranges from 17% to 50%,[14,17] increasing in some publications up to 100% in eyes with stage 3 disease.[14] In contrast to MOP, however, myopia after severe ROP is relatively stable in early childhood .In summary children with laser-treated severe ROP had the highest prevalence of refractive errors during the first 2 years of life, indicating that such children should be monitored for at least 2 years.

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In conclusion, refractive errors especially myopia is common among preterm babies. They may or may not be associated with ROP and may hinder development of normal binocular vision. In order to prevent significant visual handicap, all preterm babies should have an ophthalmological examination at one year of age and long-term follow up should be insured.

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