

**Introduction**

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## INTRODUCTION

Retinopathy of prematurity (ROP) is a disease of incomplete retinal vascularization in infants. Severe ROP, which places the infant at risk of visual disability, is known as threshold ROP (*Phelps, 2001, Shaffer et al., 1996*). When an infant develops threshold disease, the risk of retinal detachment and poor visual outcome is approximately 50% if not treated with ablative surgery. Threshold ROP is more prevalent in extremely premature infants (*Palmer et al., 1991*).

Extremely low birth weight (ELBW) infants are also prone to Candida sepsis and the incidence of candidemia has increased significantly in ELBW infants as their survival has improved (*Kossoff et al., 1998*). A few clinical reports suggest a potential causal relationship between Candidemia and increase risk of threshold ROP, also the risk of endophthalmitis is more in premature infants with disseminated candidiasis (*Gaynon and Stevenson 2000*). In 1992, Kremer et al. reported that 8 of 15 ELBW infants with Candidemia developed threshold ROP and required cryosurgery. This was only a case series, but it suggested an association that warranted further investigation (*Kremer et al., 1992*) and (*Jampol et al., 1996*). In 1998, *Mittal et al* reported that Candida sepsis in ELBW infants was significantly associated with increased severity of ROP and a more than five fold increased need for laser surgery.

Human milk has recently been shown to have many protective constituents. These antioxidant constituents include inositol, vitamin E, and beta-carotene that may protect against the development of ROP, although the exact mechanism of protection against ROP is still under research (*Mary et al., 2001*).

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With the increased survival of very low birth weight infants (VLBW), weighing less than 1500g at birth, the incidence of ROP, a significant cause of blindness among children, is also increasing (*Wheatley et al., 2002*). Preterm infants with a positive diagnosis of ROP during the <sup>neonatal</sup> perinatal period are at increased risk for ocular abnormalities and for deficits in visual function during later periods of development (*Allen et al., 1993*). ROP occurs principally in premature infants. It occurs in two somewhat overlapping phases:

1. An acute phase, in which normal vasculogenesis is interrupted and a response to injury is observable in the retina.
2. A chronic phase, or late proliferation of membranes into the vitreous, during which tractional detachments of the retina, ectopia, and scarring of the macula and significant visual loss occurs (*Flynn et al., 1987 and Wheatley et al., 2002*).

ROP is unique in that the vascular disease is found principally in infants with an immature, incompletely vascularized retina; hence its connection with premature infants (*Ober and palmer, 1995*). The condition is caused by a combination of factors of which the most important is prematurity (*Rowlands et al., 2001*). The condition is due to fetal retina <sup>vascular</sup> that is not on the temporal side at 7-8 months. Although vasularization on the nasal side is complete by 8 months. Hence the temporal area of the retina is at risk of ischemia and fibrovascular proliferation (*Kretzer and Hittner, 1986*).

Along with VLBW come many associated complications of preterm birth, including chronic lung disease, longer duration of mechanical ventilation and the need for higher concentrations of oxygen supplementation, and sepsis. These factors have all been shown to correlate with ROP severity. Additional factors such as blood transfusion

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and intraventricular hemorrhage have also been implicated (*Hunter and Repka, 1993*).

Apart from its distinction as an important cause of childhood blindness that may be prevented by timely intervention directed by a skilled examiner, ROP is at the nexus of the progressive understanding of ocular neovascularization in general. This, in turn, has provided a major challenge to all physicians dealing with the premature infants and has created renewed interest in the pathogenesis, prevention, and treatment of ROP (*Seors and Capone, 1999*).

It was believed that if the arterial oxygen was kept within prescribed guidelines, ROP might be eliminated. However, with the ability of neonatologists to keep alive ELBW and VLBW there is a resurgence of ROP despite tight control of the partial pressure of oxygen (*Phelps, 1995*). This increases the population susceptible to ROP and has led to a corresponding increase the incidence of ROP. Most cases of ROP are mild and undergo spontaneous regression with no visual squeals in the majority of affected infants. However, progression to advanced ROP does occur in a significant number of infants and can lead to severe visual impairment and even complete unilateral or bilateral blindness in some cases (*Ober and Palmer, 1995 and Seors and Capone, 1999*).

Although breast milk has been shown to have protective factors against ROP, and has also antibodies against Candida, still the relationship between the development of Candidemia and type of feeding not fully understood. Also the feeding practices e.g. exclusive versus supplemented or fortified breast milk are known to influence the bioavailability of the different active components in breast milk. Hence it is not only the mere act of intake of breast milk that can influence the outcome of ELBW, but it is probably an interaction of different factors

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related to type of milk and feeding practices. ELBW infants are exposed to many complications and invasive procedures of which mechanical ventilation and prolonged use of antibiotics are the most challenging for the neonatologists. It has been shown that in many NICU centers in developed countries that use breast milk and are guided by emerging skills in lactation management have shown remarkable improvements and an overall better survival rates and long term outcome of preterm infants (*Barriga et al 1997*). Unfortunately in Egypt, there are currently no NICU centers in the country that follow the guidelines for feeding preterms exclusively on breast milk and encouraging Kangaroo Mother Care (KMC). The latter has been shown to improve oxygenation in these high risk infants who are struggling for survival in a man-made machine that provides heat and oxygen but lacks the warmth, nurture and protection that nature can substitute in KMC (*Bell and McGrath, 1996*). Unfortunately, pediatricians may verbally encourage it, but fail to act upon it. Also many medical personnel in our Egyptian centers express unfounded fears that providing breastmilk to preterm is dangerous as the risk of sepsis is high and that expressed breastmilk may be contaminated also mothers of preterm may break the infection control measures in these units and increase the risk of morbidity and mortality. Still many more are mislead by the marketing tactics of infant milk formula companies that seek conniving and devious strategies to bring their milks in these units under the pretence that it could be life saving and biochemically fitting with the needs of these babies, omitting the immunological and developmental needs that these milks lack and the detrimental consequences these milks continue to demonstrate on these small babies.

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