KANGAROOCARE NICU PROTOCOLS

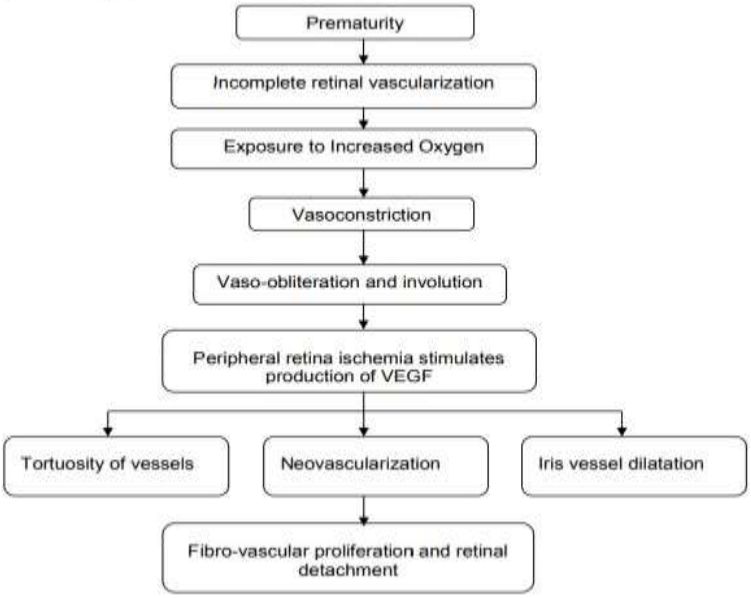
Retinopathy of Prematurity

Retinopathy of prematurity (ROP) is a developmental abnormality of the retina and vitreous in preterm infants which involves disordered vascularization, cellular maturation and cellular differentiation. It is an important cause of visual impairment and the outcome can be improved if the disorder is detected by screening which allows appropriate treatment and follow-up (RCO/BAPM 1995, Schaffer et al 1992 and Watts 1992). This guideline for screening to detect ROP and its treatment is based on the Guidelines for Care around preterm birth (NHMRC 1996).

Incidence and risk factors:

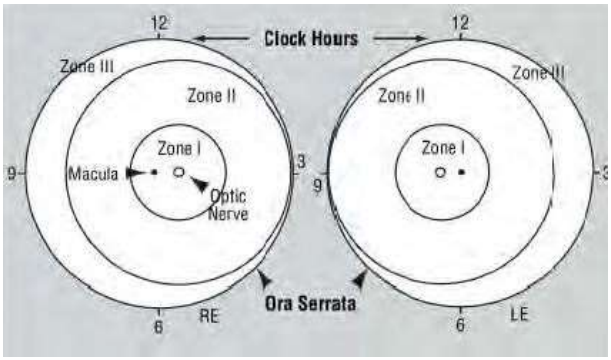
- Extremely preterm (< 28 weeks)- 61 %, with severe disease (stage 3 or above) in 21%.
- Very preterm (includes all < 32 weeks) - 33%, with severe disease in 5-9%.
- In those that develop ROP, it is usually first detected at 30-45 weeks Postmenstrual age (PMA) and reaches stage 3 at a mean PMA of 37 (range 32-50) weeks.
- If infants have been screened and ROP does not appear until after 36 weeks PMA, it is unlikely to be severe.

Pathophysiology:



Classification

1. Location



2. Extent

Refers to the circumferential location of disease and is reported as clock hours in the appropriate zone.

3. Staging of disease

- **Stage 1 Demarcation line –** a flat whitish line of demarcation seen between vascularised and avascular retina (a normal retina has a tenuous, non-linear, feathery border).
- **Stage 2 Elevated ridge –** demarcation is now a ridge rather than a line and has height and width and extends above the plane of the retina. Small isolated tufts of neovascular tissue (called popcorn) may be seen posterior to the ridge structure.
- **Stage 3 Neovascularization –**From the surface of the ridge, abnormal blood vessels grow and extend into the vitreous (extra-retinal fibrovascular tissue) instead of following their normal growth pattern along the surface of the retina. This extraretinal proliferating tissue is continuous with the posterior aspect of the ridge, causing a ragged appearance.
- **Stage 4 Partial detachment of retina caused by traction from scar tissue.** The extent of detachment depends on the number of clock hours of fibro vascular traction and their degree of contraction. Typically, retinal detachments begin at the point of fibrovascular attachment to the vascularised retina. Further divided into 2 parts: • 4A Partial detachment sparing macula. • 4B Partial detachment involving macula.
- **Stage 5 Total retinal detachment** which are generally tractional and may occasionally be exudative. They are usually funnel shaped, and divided into anterior and posterior parts. When open both anteriorly and posteriorly, the detachment generally has a concave configuration and extends to the optic disc.

4. Plus and Rush Disease

- **Plus disease -** Presence of dilatation and tortuosities of the posterior pole blood vessels involving at least two quadrants of the retina.
- **Pre-'Plus' Disease -** More arterial tortuosity and venous dilatation is seen than normal, but is not severe enough to be classified as 'Plus'
- **Rush" Disease (Aggressive Posterior ROP, AP-ROP):** A rare and severe form of ROP with increased tortuosity and dilatation of vessels present in all 4 quadrants of zone 1 and sometimes zone 2 and is out of proportion to the peripheral retinopathy. May not sequentially advance through Stage 1 to 3 but often rapidly advances to stage 4 or 5. AP-ROP typically extends circumferentially and is often accompanied by a circumferential vessel.

Whom to screen?

a. Babies with birth weight <1500 g
b. Babies born ≤33 weeks of gestation
c. Selected preterm infants with a birth weight > 1500 gm or gestational age of more than 33 weeks with unstable clinical course like need of cardiorespiratory support, prolonged oxygen therapy, apnea of prematurity, anemia needing blood transfusion, severe IUGR, Persistent Hyperglycemia, multiple births and neonatal sepsis
d. Suggested by attending neonatologist to be at high risk.

When and how often to screen?

First screening examination should be carried out at 31 weeks of gestation or 4 weeks of age, whichever is later (table below)
A good rule to remember is first screening at 1 month of postnatal age in babies born at >26 weeks of gestation age.
Timing of First Screening Eye Examination Based on Gestational Age at Birth

Gestation age at birth (weeks)	Age at initial examination	
	Postmenstrual age	Chronological age
22	31	9
23	31	8
24	31	7
25	31	6
26	31	5

27	31	4
28	32	4
29	33	4
30	34	4
31	35	4
32	36	4

Follow-up examinations:

As recommended by the examining ophthalmologist on the basis of retinal findings.

Where to examine the baby?

In the neonatal unit itself under supervision of NICU staff/ neonatologist

Preparing the parents

This is a difficult time for parents, who may be recovering from the stress of their baby's acute illness. The news that their baby has a potentially blinding condition which requires urgent treatment must be handled with the utmost consideration. This is helped by the provision of written information explaining screening and severe ROP.

How to dilate the pupils?

- Tropical plus Eye drops (Tropic amide 0.8% + Phenylephrine 2.5%).
- Instill 0.5 ml eye drops in both eyes every 15 minutes.

Precautions during examination

1. The examinations should be kept as short as possible
2. Discomfort to the baby should be minimized by administering oral sucrose just before examination, and swaddling the baby, nesting or use of the pacifier.
3. Baby should not have been fed just before examination to avoid vomiting and aspiration
4. Strict Hand washing and maintain asepsis.

LASER therapy preparation:

- Take consent
- Ensure good pupillary dilatation
- Nil by mouth 3- 4 hrs prior to procedure
- Start on intravenous fluids
- Monitor the babies vitals during the procedure.

- Use warmer for maintaining temperature.
- Keep ready for intubation and ventilation.
- Arrange drugs such as: morphine, midazolam, normal saline 10% Dextrose, adrenaline

Post-operative Care:

1. Close monitoring
2. Oral feeds can be started shortly after the procedure, if vital parameters stable. Some infants may have feed intolerance post screening and should be managed as per the feeding protocol
3. Premature babies, especially those with chronic lung disease may have increase or re-appearance of apneic episodes or an increase in oxygen requirement. Therefore they should be carefully monitored for 48-72 hours after the procedure.
4. Antibiotic drops (such as Tobramycin/Ciplox) should be instilled 6-8 hourly for 2-3 days.

Reference

- AIIMS protocol
- Kumar P, Sankar MJ, Deorari A, et al. Risk factors for severe retinopathy of prematurity in preterm low birth weight neonates. Indian J Pediatric 2011; 78:812-6.
- Royal Prince Alfred Hospital Guideline on Retinopathy of Prematurity
- The International Classification of Retinopathy of Prematurity revisited. Arch Ophthalmic 2005; 123:991-9.
- Screening examination of premature infants for retinopathy of prematurity. Pediatrics 2006;117:572-6.
- Hand book of Neonatology(IAP)

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Guideline accepted date	June 2019
Guideline review date	June 2020