

LOW BIRTH WEIGHT BABIES

- **Objectives**
 - To understand the types and causes of LBW
 - To learn appropriateness of birth weight to gestation
 - To recognize the problems of LBW neonates
 - To learn the principles of management
- **Definition: Birth weight <2500 g**
- **Incidence :~30% of neonates in Sri Lanka**
- LBW babies account for about 75% neonatal deaths and 50% infant deaths
- LBW babies are more prone to:
 - Malnutrition
 - Recurrent infections
 - Neurodevelopmental delay
- **LBW babies have higher mortality and morbidities**
- Two types based on the aetiology

Preterm

- <37 completed weeks of gestation
- Account for 1/3rd of LBW

Small-for-date (SFD) / Intra Uterine Growth Restriction (IUGR)

- <10th centile for gestational age
- Account for 2/3rd of LBW neonates

Aetiology of Prematurity

- Low maternal weight, teenage / multiple pregnancy
- Previous preterm baby, cervical incompetence
- Antepartum hemorrhage, acute systemic disease
- Induced premature delivery for maternal pre-eclampsia etc
- Majority unknown

Aetiology of SFD / IUGR

- Poor nutritional status of mother
- Hypertension, toxemia, anaemia
- Multiple pregnancy, post maturity
- Maternal chronic illness
- Tobacco use

Prematurity

- Date of last regular menstrual period
- Ultrasound scans in the first trimester
- Physical features
 - Breast nodule
 - Genitalia
 - Sole creases
 - Ear cartilage / recoil

SFD / IUGR

- Intrauterine growth chart
- Physical characteristics
 - Emaciated look
 - Loose folds of skin
 - Lack of subcutaneous tissue
 - Head bigger than chest by >3cm

Pre-term problems

- Birth asphyxia
- Hypothermia
- Respiratory distress
- Feeding difficulties
- Hypoglycemia
- Infections
- Hyperbilirubinemia
- Apnoeic spells
- Intraventricular hemorrhage
- Metabolic acidosis

Problems – SFD babies

- Birth asphyxia
- Hypothermia
- Hypoglycemia
- Infections
- Polycythemia

LBW – issues at birth

- Transfer mother to a well-equipped center before delivery
- Skilled person needed for effective resuscitation
- Prevention of hypothermia – topmost priority

LBW – needs for referrals / admissions

- Birth weight <1800 g
- Gestation <34 wks
- Unable to feed** *Irrespective of birth weight and gestation*
- Sick neonate*

Keeping warm in hospital

- Skin-to skin method
- Warm room
- Warmly wrapped
- Incubators

Deciding the initial feeding method

Two factors

1. Hemodynamically stable or not?
2. Feeding ability

Deciding the initial feeding method

Is (s)he stable?

Presence of any one of these signs = UNSTABLE

- Fast breathing (RR>60/min)
- Severe chest in-drawing
- Apnoea
- Requirement for oxygen
- Convulsions
- Abnormal state of consciousness
- Abdominal distension

Gestational age	Maturation of feeding skills	Initial feeding method
< 28 weeks	No proper sucking from breast; may suck hand Reduced gut motility	Intravenous fluids TPN
28-31 weeks	Immature sucking bursts Poor coordination between suck/swallow and breathing	OG tube feeding with occasional cup feeding
32-34 weeks	Slightly mature sucking pattern Coordination begins	Feeding by cup / spoon
>34 weeks	Mature sucking pattern More coordination between breathing and swallowing	Breastfeeding

In spite of the above generalisations babies are very variable in their ability to feed and suck. The above can be used as an initial guide but baby needs to be observed during attempted feeding to assess actual ability. Some babies learn very quickly too.

Progression to oral feeds

- Based on two factors
- Stable or not?
- Maturation of feeding ability

Choice of milk

Breast milk

- Perfectly adapted to the infants’ needs – start breast feeds / EBM within one hour of birth
- Consistent evidence:
 - Reduces infections and necrotising enterocolitis
 - Improves neurodevelopmental outcomes
 - Long term effects on blood pressure, lipid profile and pro-insulin levels
- The best milk for a LBW infant is his/her own mother’s milk
- In case mother’s milk is not available, then the choices in order of preference are:
 - Expressed donor milk (only where milk banking available)
 - Infant formula (standard/pre-term formula)

Nutritional supplements

Gestation <37 weeks and / or birth weight < 2000g

- Iron: from 2 weeks
- Multivitamin: from 2 weeks of life (for vitamin D)

Gestation <32 weeks and / or <1500 g

- Calcium & phosphorus
- Multivitamin
- Iron

Nutrient supplementation

Recommended supplements for infants 1500 - 2000g			
Nutrient	Route	Dose	When
Iron	Enteral	2 mg elemental iron/kg/day (maximum 15 mg/day)	From 2 weeks of age (if tolerating full enteral feeds)
Multivitamin	Enteral	For Vitamin D 200-400 IU/day	From 1 week of age until 12 months of age

Supplements for breast milk fed infants <1500g				
Nutrient	Route	Dose	When to start?	When to stop?
Phosphorus	Enteral	100 mg/kg	From time of tolerating full enteral feeds	Until 40 weeks post-menstrual age
Calcium	Enteral	200 mg/kg/day	- do -	- do -
Multivitamin	Enteral	Vit D 400 IU/day	- do -	Until 12 months of age
Iron	Enteral	2 mg/kg/day	From 2 weeks of age / tolerating full enteral feeds	Until 23 months of age

Key messages

- LBW infants - at risk of high mortality and significant morbidities
- Two major types of LBW - Preterm and IUGR/SGA
- Morbidities different in both types
- Choice of feeding method - based on the feeding ability of the infant
- Breast milk – milk of choice, irrespective of the feeding method

Low birth weight (LBW) infants, including those with very low birth weight, should be fed mother's own milk.

LBW infants, including those with very low birth weight, who cannot be fed mother's own milk should be fed donor human milk (recommendation relevant for settings where safe and affordable milk banking facilities are available or can be set-up).

LBW infants, including those with very low birth weight, who cannot be fed m

VLBW infants who cannot be fed mother's own milk or donor human milk should be given preterm infant formula if they fail to gain weight despite adequate feeding with standard infant formula.

LBW infants, including those with very low birth weight, who cannot be fed mother's own milk should be fed standard infant formula from the time of discharge until 6 months of age (recommendation relevant for resource-limited settings).

Very Low Birth Weight (VLBW) infants who are fed mother's own milk or donor human milk should not be routinely given bovine-milk based human milk fortifier.

VLBW infants who fail to gain weight despite adequate breast milk feeding should be given human milk fortifiers, preferably those that are human-milk based.