

## Birth asphyxia

### Objectives:

By the end of this lecture, you should be able to answer the following questions:

1. What is Birth Asphyxia?
2. Which baby is at risk for birth asphyxia?
3. How can I diagnose it?
4. How can I treat the baby?
5. What is the outcome?

**Definition:** Insult to fetus or newborn due to lack of oxygen (hypoxia) and/or lack of perfusion (ischemia) to various organs with tissue lactic acidosis.

- Birth asphyxia is a syndrome, collection of features, with the exclusion of alternative conditions

1. Meconium staining of the amniotic fluid
2. Electronic fetal monitoring
3. Acidosis
4. Apgar Score:

Score Sign	0	1	2
<b>A:</b> appearance (color)	pale	Centrally pink- peripherally blue	Pink all over
<b>P:</b> pulse	absent	<100/min	>100/min
<b>G:</b> grimace (reflex irritability)	No response	Some motion	cry
<b>A:</b> activity (muscle tone)	limp	Some flexion	Good flexion
<b>R:</b> respiratory effort	absent	Weak cry	Strong cry

5. Hypoxic ischemic encephalopathy
6. Multi-organ involvement

### Etiology of asphyxia:

#### **Causes before birth:**

1. Low maternal blood pressure
2. Inadequate relaxation of the uterus (excessive administration of oxytocin)
3. Premature separation of the placenta
4. Compression of the cord
5. Placental insufficiency ( PET, toxemia, maternal chronic illnesses & post-maturity)

#### **Causes after birth:**

1. Anemia (severe hemorrhage, hemolytic disease)
2. Shock (massive blood loss, overwhelming infection)

### Differential Diagnosis:

1. Sedation/ analgesia.
2. Sepsis/ meningitis.
3. Congenital malformations.
4. Neuromuscular disease.
5. Intracranial hemorrhage.
6. Shock antepartum or intrapartum hemorrhage.

### Treatment:

1. Diagnosis during intrapartum period
2. Resuscitation of the newborn baby
3. General support of the infant
4. Management of complications
5. Brain orientated management

### General support:

- Nurse in thermoneutral environment
- Avoid hypo- and hyperglycemia
- Measure blood gas: treat hypoxia with oxygen and treat hypercarbia with IPPV
- Review infection risk & treat with antibiotics
- Adequate hydration
- Treat hyperbilirubinemia

### Brain orientated management:

- Cerebral perfusion: monitor blood pressure (mean arterial bd pr > 40 mmHg )
- Seizures:
  - Initial seizure: give phenobarbital
  - If persistent seizure consider: \*phenytoin \*clonazepam
- Intracranial hypertension:
  - Give 20% less than fluid need
  - If full fontanel and seizure, give mannitol 20% (1g/ kg). Avoid if the baby is oliguric

### Prognosis:

The out come of birth asphyxia depends upon the criteria used to make the diagnosis. These include:

#### **1. Apgar score:**

- There is close relation between severe (0-3) & moderate (4-6) depression of apgar score at 5 min.
- Persistent low apgar score with increase time carries higher risk of death & CP.

#### **2. HIE:**

- The out come is related to the severity of HIE

Birth asphyxia	Moderate	Severe
Disabled	20%	71%
Death	4.5%	62%

#### **3. Brain imaging:**

- CT scan & MRI: the MRI is of good prognostic role in asphyxiated babies

#### **4. Doppler:**

- Accurate predictive value of adverse out come in asphyxiated full-term infants
- High mean flow velocity above 3SD from the mean (94% +ve P V of adv out come)
- Doppler abnormalities appear within 12-60 hr after Birth

#### **5. Electrocortical activity:**

- EEG is a useful prognostic tool (Severe EEG abnormality may indicate very poor prognosis)