

Neonatal Respiratory Distress

[Neonatal eHandbook RDS and differentials](#)

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Respiratory distress in the newborn

AIMS:

- Understand the important differential diagnoses to consider when neonates present with respiratory distress
- Key management of the above conditions

Case

- 34 week infant is delivered by NVD following PROM and precipitous labour
- The mother presents in active labour and delivers within 1 hour of arrival

- On delivery, the newborn is grunting, with work of breathing and RR 80
- Cpap is commenced in the delivery room and continued on transfer to SCN

What is your differential diagnosis?

What should be the next steps of management?

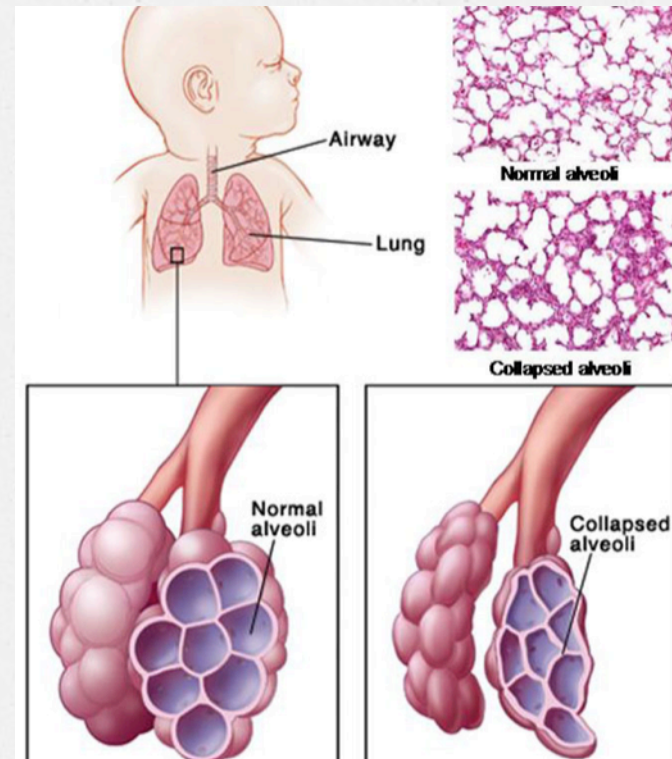
What antenatal treatment if time had permitted would have improved the newborn's clinical situation?

Differentials

- o Respiratory Distress Syndrome (RDS)
 - o Also known as HMD (Hyaline Membrane Disease)
- o Congenital Pneumonia
- o Pneumothorax

RDS

- Disease of surfactant deficiency
- Surfactant decreases surface tension and improves lung compliance
- Surface tension: intrinsic tendency for alveoli to collapse

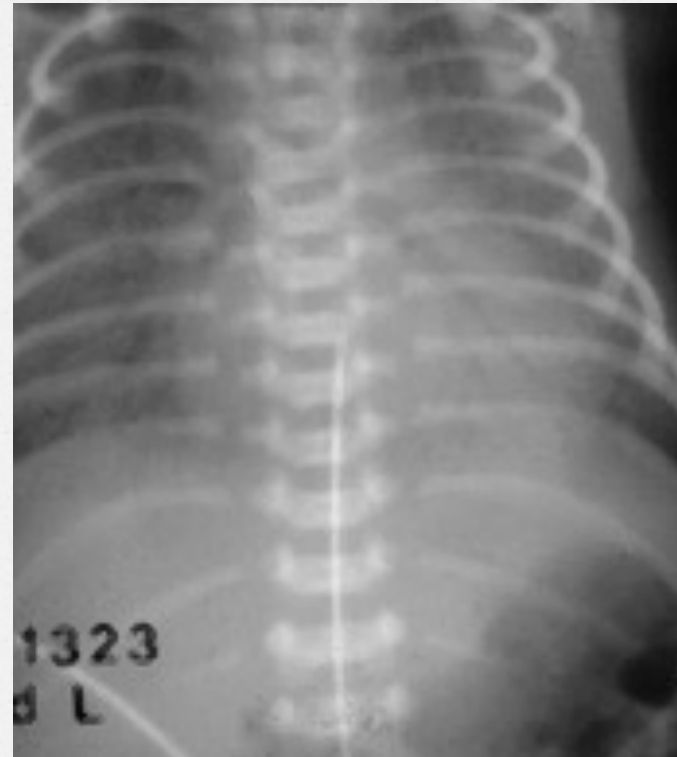


RDS

- o Tachypnea
- o Retraction
- o Grunting
- o Nasal flaring
- o Apnoeas
- o Cyanosis
- o Extremities puffy or swollen
 - o Diuresis is a sign of improvement
- o Classically gets worse in first 24 hours before then improving

RDS

- Ground glass appearance
- Reticulogranular
- Air bronchograms



RDS

oA&B:

- o Ventilation/ CPAP/ O2 support as needed
- o ? surfactant

oC:

- o Circulatory support – fluids/ inotropes
 - o Accurate fluid balance
- o Bloods – CRP, FBE, BC, Gas

oD:

- o Check BSL

oE:

- o Antibiotics
- o Thermal support

Outcomes are better if time for ANTENATAL STEROIDS

Congenital Pneumonia

o Sepsis risk factors:

o PROM

o Prem

o Maternal fever,
dicharge, abdominal
pain, leukocytosis

o Colonization with GBS

o Same signs of RDS



Congenital Pneumonia

oA&B:

- oVentilation/ CPAP/ O2 support as needed

oC:

- oCirculatory support – fluids/ inotropes

 - oAccurate fluid balance

- oBloods – CRP, FBE, BC, Gas

oD:

- oCheck BSL

oE:

- oAntibiotics – adequate cover – Ben Pen, Gent +/- Cef/
Amoxicillin

- oThermal support



What are the likely
organisms?

Organisms

- GBS
 - Ecoli
 - Enterococcus
 - Listeria
- Don't forget RSV in winter! (although usually a few days after birth)

Pneumothorax

- May occur spontaneously during delivery
- Most common when receiving **positive pressure**
- Space occupying lesion within the chest displacing lung, and if under tension, compromising venous return – leading to **TENSION** pneumothorax

Pneumothorax

- Presents with non-specific signs of respiratory distress
- O₂ requirement
- Unequal, decreased breath sounds (may be subtle)
- May co-exist with RDS



Pneumothorax

oA&B:

- oVentilation/ CPAP/ O2 support as needed
- oCXR - Needle thoracocentesis/ chest drain

oC:

- oCirculatory support – fluids/ inotropes
 - oAccurate fluid balance
- oBloods – CRP, FBE, BC, Gas

oD:

- oCheck BSL

oE:

- oAntibiotics – adequate cover – Ben Pen, Gent +/- Cef/
Amoxicillin
- oThermal support

Case 2

- Term baby is delivered by Emergency Caesarian due to failure to progress
- Meconium has been noticed during labour
- The mother is known to have gestational diabetes

Case

o The baby requires 5 minutes of IPPV and then has ongoing work of breathing with RR 70 and sats 80 in air which rise to 94 in FiO₂ 30% with CPAP 7

What is your differential diagnosis?

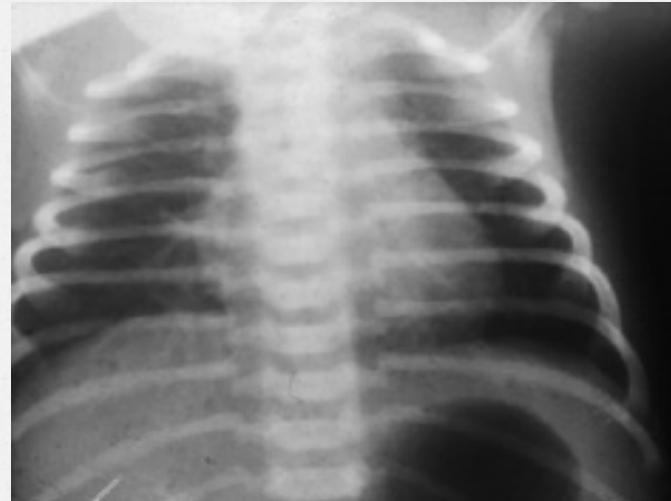
What is your management?

Differentials

- o Sepsis/ Congenital pneumonia
- o Transient tachypnoea of the newborn (TTN)
- o Meconium Aspiration
- o RDS
 - o (even though term baby, higher rates if mother's have diabetes)
- o Pneumothorax
- o PPHN – Persistent Pulmonary Hypertension of the Newborn

TTN

- Term
- Caesarian delivery
- Usually tachypnoea with min O₂ requirement
- Resolve in 48-72 hours
- “wet lungs” with fluid in the fissures



TTN

oA&B:

- oVentilation/ CPAP/ O2 support as needed
- oCXR (if on CPAP/ ventilation)

oCirculatory support – fluids/ inotropes

- oAccurate fluid balance
- oBloods – CRP, FBE, BC, Gas

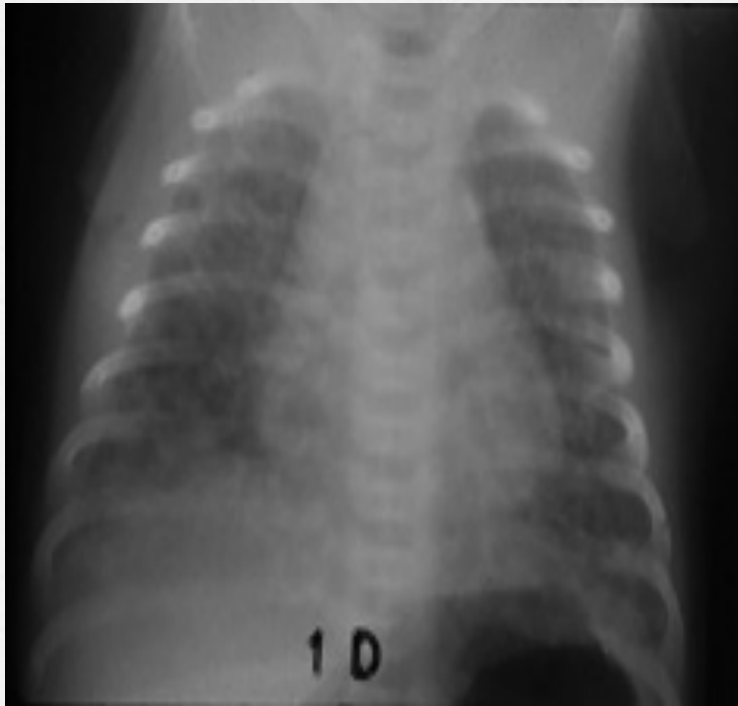
oD:

- oCheck BSL

oE:

- oAntibiotics
- oThermal support

Meconium aspiration



- Stress and intra-uterine meconium in term infant
- Gasping in utero causes aspiration
- Chemical diffuse pneumonitis
- Signs of respiratory distress

Meconium aspiration

oA&B:

- oVentilation/ CPAP/ O2 support as needed
- oCXR (if on CPAP/ ventilation)

oCirculatory support – fluids/ inotropes

- oAccurate fluid balance
- oBloods – CRP, FBE, BC, Gas

oD:

- oCheck BSL

oE:

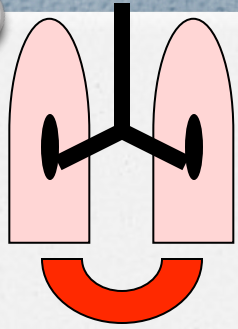
- oAntibiotics
- oThermal support

PPHN

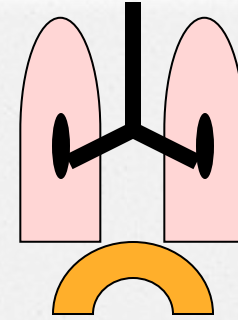
- Primary pulmonary hypertension is a pure vascular disease
- More often present in a mixed picture as in the setting of meconium aspiration syndrome or asphyxia
- In response to an asphyxia event in utero, the fetus diverts all blood flow possible to vital organs (brain/heart/adrenals)
- This leads to vasoconstriction of non-vital vascular beds, including the pulmonary bed

PPHN

- o Respiratory distress with hypotension
- o Hypoxemia out of proportion to degree of distress
 - o This could also be a sign of CONGENITAL CARDIAC disease
- o Difference in pre and post ductal sats
 - o Right hand
 - o Lower extremities
 - o Hyperoxia test



PPHN



Decreases R \rightarrow L shunt:

Decrease PVR

Increase pulmonary
blood flow

- o Hyperoxia
- o Hypocarbica
- o Lack of acidosis

Increases R \rightarrow L shunt:

Increase PVR

Decrease pulmonary
blood flow

- o Hypoxia
- o Hypercarbia
- o Acidosis

PPHN

o A&B:

- o Ventilation/ CPAP/ O2 support as needed/ surfactant
- o CXR
- o **Nitric oxide**

o Circulatory support – fluids/ inotropes

- o Accurate fluid balance
- o Bloods – CRP, FBE, BC, Gas
- o **ECHO**

o D:

- o Check BSL

o E:

- o Antibiotics
- o Thermal support

o Improve pulmonary blood flow:

- o Keep well saturated
- o Normocarbia

o **Avoid:**

- o **Hypoxia**
- o **Hypercarbia**
- o **Acidosis**

Other causes of neonatal respiratory distress

- o Upper airway
 - o Choanal atresia
 - o Pierre Robin sequence
- o Congenital cardiac disease
- o Congenital lung anomalies
 - o Congenital diaphragmatic hernia
 - o Congenital adenomatous lung malformation

Key points

- Many differentials
- Initial treatment will be the same – and need to support A&B; cover sepsis etc
- If requiring CPAP – get a CXR
- Gas guides therapy in monitoring degree of respiratory acidosis