GUIDELINE

Transient Tachypnoea of the Newborn (TTN)

Scope (Staff):	Nursing and Medical Staff
Scope (Area):	NICU KEMH, NICU PCH, NETS WA

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CAHS Child Safe Organisation Commitment Statement

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Aim

To guide management of the infants with suspected Transient Tachypnoea of the Newborn (TTN).

Risk

May result in worsening of the respiratory distress and missing of pathological conditions which mimic TTN (refer to differential diagnoses).

Background

Transient tachypnoea of the newborn (TTN) is one of the commonest causes of respiratory distress in newborns especially in late-preterm and term infants.[1] TTN results from delay in clearance of fetal alveolar fluid after birth. The management consists of supportive care, with symptoms generally resolving by 24-72 hours of age.[2]

Epidemiology

TTN occurs in ~10% of infants born between 33 and 34 weeks gestational age, ~5% of infants delivered at 35 to 36 weeks, and less than 1% of all term infants.[3]
Risk factors for TTN include:

- elective caesarean section
- delivery before completing 39 weeks of gestation
- maternal diabetes
- maternal asthma
- male gender
- small or large-for-gestational age.[4-7]

Pathophysiology

Fetal lung fluid is essential for normal lung development and is secreted by lung epithelium. A few days prior to the onset of labour, lung fluid production decreases. During labour, maternal epinephrine and glucocorticoids stimulate absorption of alveolar fluid through activation of an amiloride-sensitive epithelial sodium channel.[8,9] "Vaginal squeeze" only accounts for a fraction of the fluid absorption. TTN results from disturbance in the mechanisms responsible for fetal lung fluid clearance.[8]

Clinical Presentation

- First hours of life with respiratory distress in late-preterm or full-term infants
- Tachypnoea; Recession/retraction/nasal flaring, grunting.
- Cyanosis which appears to resolve with < 40% oxygen.
- Barrel chest (symmetric hyperinflation) in some infants.

Differential diagnosis

TTN is a diagnosis of exclusion. Many infants experience tachypnoea and mild respiratory distress for a short period of time (two to four hours) after birth which is often referred as "transitional delay" or "non-specific respiratory distress".[10]

Respiratory distress due to TTN resolves by 72 hours in most of the cases. If respiratory distress persists beyond 3-5 days, alternative diagnosis is more likely. Thus, TTN is a retrospective diagnosis.

Differential diagnoses of TTN include:

- respiratory distress syndrome
- pneumonia
- meconium aspiration syndrome
- pneumothorax
- tachypnoea resulting from central nervous system irritation or metabolic acidosis
- inborn errors of metabolism
- and congenital lung and heart malformations.[9]

Investigations

- Baseline observations including pulse-oximetry (Refer to Monitoring and Observation Frequency guideline).
- Blood gas (to look for respiratory acidosis) and glucose level.
- Chest X-ray (AP and Lateral): Prominent ill-defined central markings suggestive of vascular engorgement radiating out from hilum, prominence of interlobar fissures (fluid), small pleural effusions, mild hyperinflation, enlarged cardiac silhouette. Chest X-ray may be delayed for 4-6 hours as a proportion of the infants with provisional diagnosis of TTN would improve in 4-6 hours[10] and may not require chest X-ray.

- Septic screen
- ECG/echocardiography if suspecting Congenital Heart Disease.

Management

TTN generally follows a benign course. Management principles include supportive treatment and careful evaluation/exclusion of more serious conditions.[11, 12]

- Provide respiratory support (CPAP with or without supplemental oxygen; Refer to Continuous Positive Airway Pressure guideline for further details) if required to maintain normal pulse-oximetry saturations (refer to Monitoring and Observation Frequency guideline) and to prevent respiratory acidosis. Invasive mechanical ventilation is usually not required. Infants who are grunting after birth with normal pulse-oximetry saturations can be managed for a short time without CPAP after discussion with senior registrar or consultant.
- Use sepsis guideline to assess need for antibiotics (Sepsis Calculator – Assessment of early-onset sepsis in infants >35 weeks gestation), if baby is stable with equivocal signs (tachypnoea or grunting alone) for up to 4 hours can be managed in low risk babies without antibiotic cover.
    - If baby is deemed unwell then antibiotics should be started.
- Commence feeds as soon as infant can tolerate them. Promote breast feeding and if ready for discharge to postnatal wards then can have first breast feed on the postnatal ward if physiologically stable with no risk factors for hypoglycaemia (i.e. maternal diabetes, IUGR, Preterm, Asphyxia).

Clinical deterioration pathway:

Also review Recognising and Responding to Clinical Deterioration guideline.

Reconsider the diagnosis of TTN if infant

- is systemically ill
- requires FiO_2 >40%
- needs ventilation
- or signs persist for more than 72 hours.

Related CAHS internal policies, procedures and guidelines
Neonatology Clinical Guidelines • Continuous Positive Airway Pressure (CPAP) • Monitoring and Observation Frequency • Recognising and Responding to Clinical Deterioration • Sepsis Calculator: Assessment of early-onset sepsis in infants >35 weeks gestation

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