

Overview

Acute infectious disease of the lower respiratory tract that occurs primarily in those aged between 2mo and 2yrs (esp young infants). Usually 2° to viral infection. A combination of ↑mucus production, cell debris and oedema produces narrowing and obstruction of small airways.

Causes

- Respiratory syncytial virus (RSV) in 50-80% cases
- Metapneumovirus
- Adenovirus (11%) - occasionally causes a similar syndrome with a more virulent course
- Parainfluenza, influenza A (often ↑↑T) & B viruses
- Less commonly: rhinovirus, enterovirus, mycoplasma, chlamydia

Epidemiology

- Peak incidence in winter.
- Incidence peaks in those aged 2-8 months.
- Prevalence may ?higher in urban areas.
- >60% children infected by 1yr, >80% by 2yrs.
- Antibodies from infection don't prevent later RSV infections
- Risk factors for severity: maternal smoking, airways obstructive disease, prematurity

Presentation

Symptoms - Early: URTI (mild rhinorrhoea, cough, and fever). 40% of infants and young children progress to LRTI (paroxysmal cough and dyspnoea after 1-2 days). Other common symptoms include wheeze, apnoea (<3mo, prem), vomiting, irritability and poor feeding.

Signs - ↑RR, ↑HR, ↑T, cyanosis, ±dehydration. Mild conjunctivitis & pharyngitis. Diffuse insp creps, expiratory wheeze, nasal flaring, tracheal tug, sternal/intercostal recession, head bob.

Differential Diagnosis

- Asthma and other causes of wheezing in childhood
- Pneumonia, Bronchitis
- Aspiration, Foreign body inhalation
- Oesophageal reflux
- Heart failure
- Cystic fibrosis, Kartagener's syndrome
- Tracheomalacia/bronchomalacia
- Pneumothorax

Investigations

Oximetry

Nasopharyngeal aspirate - not routine unless req for cohorting to ↓cross infection in hospital

- Respiratory organisms identified by either immunofluorescence, enzyme immunoassay, PCR or culture

CXR: Usually not helpful - likely to show non-specific hyperinflation, patchy infiltrates; focal atelectasis; air trapping; flattened diaphragm; increased AP diameter; peri-bronchial cuffing.

Bloods: other than BSL, not required unless toxic, dehydrated or on IV fluids (UEC). *FBC*: usually normal.

Blood culture only if bacterial LRTI suspected.

ABG: only in the severely ill patients, especially those requiring mechanical ventilation

Management

Supportive:

- **Oxygen** (to maintain $\text{SaO}_2 \geq 90-92\%$): via NP, headbox, NIV, IPPV.
- **Humidified high flow nasal prong oxygen** (provides some CPAP & should $\downarrow \text{FiO}_2$ req) 1-2L/kg/min if $\text{SaO}_2 < 90\%$, mod-sev resp distress and failure of std flow O_2 therapy.
- Regular, gentle nasal suction may give short-lived relief & \downarrow LOS - use prior to feeding.
- Nutrition: small freq oral feeds (e.g. q2h), else $\frac{2}{3}$ - $\frac{3}{4}$ of total daily feed by NG/OG (bolus or continuous) if can't suck, or IVF (care as SIADH may occur) if sev/tube not tolerated.

Specific

- **Bronchodilators** e.g. **salbutamol** may improve clinical scores briefly, but not O_2 req, ventilation or hospitalisation. Trial (1 dose) if $>6\text{mo}$ & atopic Hx, continue if effective.
- **3% saline** nebs 4ml q8h may reduce LOS for non-sev inpts, but not shown to \downarrow admission. (Give with bronchodilator (e.g. **adrenaline**) as 1% may get bronchoconstriction.)
- **Steroids** generally do not help. [However a recent studies (2009 Plint) suggests combination of daily **dexamethasone** PO + **adrenaline** nebs may \downarrow admission, but **?SE**].
- **Heliox** may \downarrow resp distress & $? \downarrow$ LOS (if given with CPAP or tight NRB mask) but $? \downarrow$ NIPPV.

Disposition

- Ward admission: if oxygen req, cyanosis, sev resp distress, dehydration/poor feeding ($<50\%$), apnoeas, diagnosis uncertain (e.g. toxic). Consider if PMHx cardiac/lung disease, prem, age $<2\text{mo}$, Down, or if home care/rapid review not assured.
- ICU admission: \uparrow severe resp distress with desaturation ($\leq 92\%$) or apnoea whilst $\text{FiO}_2 \geq 50\%$, or if exhausted (rising PaCO_2). CPAP or intubation may be required.

Not currently recommended:

- **Montelukast** has theoretical benefits which are not apparent clinically.
- **Ribavirin**: no clear evidence of clinical benefit. Rarely given in immunosuppressed or sev cardiac disease. **SE**: $? \text{teratogenic}$.
- Antibiotics are not indicated unless evidence of 2^o bacterial infection.
- Regular chest physiotherapy also not helpful.

Prognosis

- Hospital admission is required in up to 1-2% of cases.
- Mechanical ventilation is required for 3-7% of admitted patients.
- Disease course: worsens over 3-5d, then majority full recovery over 7-10 days.
- Cough & wheeze (post-bronchiolitic syndrome) can persist for weeks or months.
- Sudden deterioration \pm fever spike may herald a bacterial secondary infection.
- No evidence that RSV infection "causes" asthma.
- Adenoviral bronchiolitis may progress to an obliterative bronchiolitis & bronchiectasis.
- Mortality rate is 1-2% of all hospitalized patients and 3-4% for patients with underlying cardiac or pulmonary disease. Most deaths occur in infants $<6\text{mo}$.

Prevention

- Good hand washing/cohorting to prevent spread.
- Breast feeding may be partially protective
- Parental smoking (ante- & postnatal) is deleterious
- RSV immunoglobulin: more research req to judge usefulness.
- **Palivizumab**, a monoclonal RSV Ig - partial protection. Requires monthly IM injections. Considered if extreme prem, acyanotic CHD, sig lung disease, or immunodeficiency.
- RSV immunisation: research continues.