TOPIC IN FOCUS – ACUTE ASTHMA IN CHILDREN

Acute Care Management of Severe Asthma in Children

Severe Exacerbations

Conscious
Agitated but
consolable

Normal Perfusion

Tachypnea*
Increased WOB*
Tachycardia#
SpO2 <92% (room air)
Wheeze ++

STEP 1
- 100% O2 NRM*
- Neb. Salbutamol /Terbutaline +
- Ipratropium Bromide (through O2)
  Q 20mins X 3 or continuous
- IV Methylpred. /Hydrocort.

Assess vitals after each nebulization and assess response after 3 nebulisations

STEP 2
Poor / Incomplete response®
Admit in HDU /ward
High flow O2 (NRM / HFNC)
Neb. Salbutamol
/Terbutaline (through O2) –
continuous /back to back
Ipratropium Bromide Q4 H neb.
IV Magnesium Sulphate

Assess vitals after each nebulization and assess response after 20-30 minutes

STEP 3
Poor Response - Admit in PICU*
- Non-invasive ventilation
- IV Salbutamol/Terbutaline
- Neb. Salbutamol /Terbutaline
  (through O2) – continuous
- Ipratropium Bromide Q 4H
- IV Aminophylline – 5mg/kg bolus
  over 60minutes(omit if already
  received theophylline derivatives)
  +/- Subcutaneous adrenaline

Assess vitals after each nebulization and assess response after 20-30 minutes

Life Threatening Asthma

Cyanosis, dusky skin
SpO2 <=92%

Step 1
- Call for senior clinician / Admit in PICU
- High flow O2 (NRM / HFNC)
  (through O2) continuous / back to back
- IV Methylprednisolone /Hydrocortisone
- IV Magnesium Sulphate
- IV Salbutamol / IV Terbutaline
+- SC Adrenaline
- Treat shock (if present),with crystalloid bolus

Monitor vitals continuously
Assess response after 20-30 minutes

STEP 2
Poor / incomplete Response®
In PICU / HDU
Non-Invasive ventilation
IV Salbutamol/ Terbutaline
Neb. Salbutamol / Terbutaline (through O2) + Ipra. Brom. – continuous (if possible)
IV Aminophylline – 5mg/kg bolus over 60 minutes(omit if already received theophylline derivatives)
+/- Subcutaneous Adrenaline

Monitor vitals continuously
Assess response after20-30 minutes

STEP 3
Poor Response®
In PICU - NIV
Consider Intubation
IV Salbutamol /Terbutaline
Neb. Salbutamol / Terbutaline (through O2)- continuous (if Possible)
Ipratropium Bromide Q 4 H
IV Aminophylline infusion if response to bolus
Subcutaneous Adrenaline

Assess vitals after each nebulization and assess response after 20-30 minutes

See next page for abbreviations, criteria, further information.
**TOPIC IN FOCUS – ACUTE ASTHMA IN CHILDREN**

- Assessment of severity is the first step in ER
- Re-assessment after each intervention is important
- Aminophylline is NOT recommended in mild to moderate asthma
- All that wheezes is NOT asthma
- Anticipate worsening of hypoxia in hypoxic asthmatics during salbutamol nebulization
- Rapid deterioration during salbutamol nebulization with O2 consider non-asthmatic etiology
- Physician / SPO2 monitoring during nebulization is mandatory.

# Dosages of common medications

<table>
<thead>
<tr>
<th>Drugs</th>
<th>Route</th>
<th>Dose</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Salbutamol</td>
<td>Nebulized</td>
<td>0.05 -0.1mg/kg Or 2.5mg (2-5 yrs.) 5mg (&gt;5 yrs.) Diluted in 3-4ml Normal saline ONLY &amp; O2 flow rate 6-8ml/min Respirator solution 5mg/ml</td>
<td>Worsens hypoxia in hypoxic asthmatics (if given without O2) Tremors, tachycardia,arrhythmias</td>
</tr>
<tr>
<td>2. Ipratropium</td>
<td>Nebulized</td>
<td>250-500 mcg Q4-6Hrly</td>
<td>Peak response develops after 30-90mins</td>
</tr>
<tr>
<td>3. Terbutaline</td>
<td>IV -Infusion</td>
<td>0.1 to 10 mcg/kg/min 3mg/kg in 50ml NS – 1ml =1mcg/kg/min</td>
<td></td>
</tr>
<tr>
<td>4. Methyl</td>
<td>IV</td>
<td>0.5 to 1mg/k/dose Q6H</td>
<td>Hypertension /Hyperlycemia</td>
</tr>
<tr>
<td>Prednisolone</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Hydrocortisone</td>
<td>IV</td>
<td>2-4mg/kg /doseQ6 hourly</td>
<td>Hypertension /Hyperlycemia</td>
</tr>
<tr>
<td>6. Magnesium</td>
<td>IV</td>
<td>25-50mg/kg/dose over 20-30min.</td>
<td>Hypotension, muscle weakness, areflexia, respiratory depression</td>
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<td>Sulphate</td>
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<tr>
<td>7. Aminophylline</td>
<td>IV</td>
<td>Loading dose: 5mg/kg/dose over 30min &lt;6mo: 0.5mg/kg/hr 0.5-1 yr : 0.85 -1mg/kg/hr 1-9yrs: 1mg/kg/hr &gt;9 yrs.: 0.75mg/kg/hr</td>
<td>AVOID if the child is on theophylline derivatives EXTREMELY narrow therapeutic index Decrease dose in patients with hepatic and cardiovascular dysfunction</td>
</tr>
<tr>
<td>8. Adrenaline</td>
<td>Subcutaneous</td>
<td>0.1ml/kg (1:10000)</td>
<td>In Life threatening or Near fatal asthma Tachycardia / Hypertension</td>
</tr>
<tr>
<td>9. Prednisolone</td>
<td>Oral</td>
<td>10mg (&lt;2 years) 20mgm stat (2-5 yrs) 30-40mg &gt;5 yrs</td>
<td>Early in the management of Acute Asthma</td>
</tr>
</tbody>
</table>

**AVOID INTUBATION if Possible**

**Absolute Indications (for Intubation)**
- Respiratory Arrest
- Cardiac Arrest
- Severe Exhaustion
- Rapid deterioration of Mental status

@ **Incomplete /Poor Response**
- Tachycardia/ tachypnea
- Persistent dyspnea / WOB
- Wheeze persistent
- Decreased air entry / Silent Chest on auscultation
- SPO2 < 92% (on high flow O2)
- PulsusParadoxus 10-15mmHg or>15mmHg
- Bradycardia and bradypnea – ominous signs indicating late respiratory failure

**# Tachypnoea**
- RR >50/min (2-5 years)
- RR >30/min (>5 years)
- RR >60/min (<2 years)

**# Tachycardia**
- HR >130/min (2-5 years)
- HR > 120/min (>5 years)

**@ Normal perfusion**
- Capillary refill time < 2 secs
- Pink colour – nail beds
- Warm extremities

*WOB : Work of Breathing
*NRM : Non Rebreathing Mask
*HFNC : High Flow Nasal Cannula

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