UPPER AIRWAY OBSTRUCTION

CROUP (LARYNGOTRACHEOBRONCHITIS): the commonest cause of upper airway obstruction

A confident clinical diagnosis of this condition can be made if the following features are present:

- Child was previously well
- < 2 years of age
- Gradually progressive inspiratory obstruction which manifests as STRIDOR
- Barking cough
- Onset a day or 2 after an upper respiratory infection
- Mild fever (<38°C) may be present
- The child is well, apart from the respiratory obstruction

Features suggesting another cause:

1) Dramatic onset of severe obstruction (foreign body)
2) Incomplete immunisation (diphtheria)
3) Dysphagia or the patient prefers a sitting position (epiglottitis, retropharyngeal abscess)
4) Systemic “toxicity” with erythematous rash (Staphylococcus)
5) Aphonia in a black child with a previously hoarse voice (laryngeal papillomatosis).

Investigations

1) Chest X-ray is not necessary nor are neck x-rays
2) X-ray lateral neck and AP is necessary only if there is serious doubt about the diagnosis of viral croup
3) Blood gasses are unreliable in assessing the need for intervention and may aggravate the problem by making the child cry

Assessment of Severity

This GRADING SYSTEM is applicable to UAO caused by CROUP only.
Stridor becomes softer as the obstruction becomes more severe.

Management

All grades of obstruction...

1) Antibiotic (AMOXICILLIN 10-25mg/kg 8H PO or 6H IV) if bacterial infection is suspected:
   - fever > 38 C
   - "toxic"
   - purulent sputum
   - concomitant ARI
2) ACYCLOVIR 500mg/m² 8H IV if oral Herpes simplex and if post measles
3) KEEP THE CHILD COMFORTABLE (the mother/carer is best at doing this) - crying and hyperventilation increase the oedema
4) Continue oral feeding
5) Avoid painful procedures
6) PARACETAMOL 15mg/kg 4-6H if febrile (stop as soon as fever resolves)
7) If unable to console the child in any other way, CHLORAL HYDRATE (50 mg/Kg 4-6H PO), and tube feed to maintain hydration
8) STEROIDS: PREDNISONE 2 mg/kg stat PO or DEXAMETHAZONE 0,5 mg/kg stat IV, provided that:
   - no measles in the past month
   - no oral Herpes
   - repeat in 24 hours if no improvement

In addition...
Grade I
Manage at home, provided:
- conditions are favourable
- the obstruction is not getting worse

In our setting, it is advisable to admit all grades of obstruction

Grade II
1) Hospitalise
2) ADRENALINE NEBULISATIONS (1 ml of 1:1 000 in 1 ml saline)
   - every 15 minutes, or more often, until improved, then every 30 minutes until Grade I, then PRN
3) Consider nebulised steroid

Grade III
1) Monitor $O_2$ saturation (use a pulse oximeter)
2) Use CONTINUOUS ADRENALINE NEBULISATIONS for two hours hoping that the obstruction improves to Grade II
3) If the obstruction remains at Grade III, consult the Paediatrician on call
4) If the obstruction progresses (at any time) to Grade IV then...

Grade IV
1) Continuous adrenaline nebulisations using 100% $O_2$
2) URGENT INTUBATION, preferably in theatre (ALWAYS let the anaesthetics and ENT departments know in ADVANCE about children with croup). This is a DIFFICULT INTUBATION and should be done by the most senior anaesthetist available.
3) Only intubate in casualty or the ward if time does not permit transfer to theatre. In this case remember to use an ETT 2 sizes smaller than usual for age. Intubate under ETOMIDATE 0.3mg/kg IV slowly.

Transfer to the nearest ICU with the ETT well secured and with the child in head box oxygen after making contact with the ICU personnel.

Oropharyngeal Obstruction: The commonest MISSED cause of upper airway obstruction

Clinical Features
- Mouth breathing
- Frequent snoring at night which may wake the child from sleep
- Obstructive sleep apnoea (OSA)
- Child AND mother are sleepy during the day
- Nasal speech
- Recurrent otitis media
- Postnasal discharge with night-time cough

In children, snoring is NEVER normal, OSA is life and brain threatening

Consequences of Snoring / Obstructive Sleep Apnoea
- Daytime drowsiness and irritability
- Learning problems
- Enuresis
- Cor pulmonale

Cor pulmonale is a marker of chronicity and/or severity. OSA always indicates severity.

Aetiology
1) Allergic rhinitis
2) Adenoidal hypertrophy
3) Tonsillar hypertrophy
4) Pierre-Robin Sequence
5) "Floppy pharynx" as in Down Syndrome

Investigations
1) Oxygen saturation awake and ESPECIALLY DURING SLEEP (this must be documented)
2) X-ray posterior nasal space (lateral view)
3) Chest X-ray and ECG if cor pulmonale is present

Indications for Adenoidectomy and Tonsillectomy and ENT referral
- If a child with a diagnosis of OSA is referred for surgery a senior anaesthetist must be aware of the case and direct the theatre and post-operative care.
- Three or more episodes of acute otitis media in preceding 12 months
- Secretory otitis media
- Obstructive sleep apnoea syndrome
- All children undergoing tonsillectomy

ADMIT the child if there is ANYTHING on history or examination suggests obstructive sleep apnoea, and refer URGENTLY to ENT. Do not waste time with an X-ray, or with trying to get an appointment at Cardiac Clinic. If cor pulmonale is present this has anaesthetic and peri-operative implications, and should NOT be used as a determinant of whether or not to relieve the obstruction. OSA is the primary determinant. If the obstruction is relieved, the cor pulmonale will go away.