Chronic cough in children

Definition

Cough in children may arise from causes anywhere along the airway, from the nose to the alveoli. Cough is a nonspecific reaction to irritation anywhere from the pharynx to the lungs. Childhood coughing is a common problem that can cause anxiety in parents.

Chronic cough in children differs from that in adults in terms of common aetiologies and management, and is increasingly defined as cough that lasts more than four weeks [1] .

Studies suggest that in 90% of children with acute upper respiratory tract infections, the cough has settled within 25 days [2] .

Epidemiology

Surveys show that chronic cough in children is common. Reported prevalence is variable but has been shown to be up to 4%, particularly in areas with intense road traffic [3] .

Gestational age less than 37 weeks, underlying medical conditions, prior wheeze and childcare attendance are risk factors for chronic cough in young children [4] .

Aetiology [5]

There is a wide range of possible causes. Isolated cough is unusual as a presentation of asthma in children, which usually is associated with other presenting symptoms.

Common causes in primary care

- Infections (or recurrent infections) - including respiratory syncytial virus (RSV), adenovirus, *Mycoplasma pneumoniae*, chlamydial pneumonia, whooping cough (pertussis) and tuberculosis.
- Asthma.
- Postnasal drip syndrome.
- Environmental agents - tobacco smoke, possibly charcoal or kerosene heaters.
- Gastro-oesophageal reflux.

Less common causes

- Inhaled foreign body.
- Cystic fibrosis.
- Immune deficiency.
- Congenital lesions - eg, tracheo-oesophageal fistula, tracheomalacia.
- Ciliary dyskinesia.
- Neurological - eg, tics, psychogenic cough. Psychogenic cough may be bizarre, honking and decrease with sleep or attention to other activities.
- Protracted bacterial infection (consider underlying condition).
- For a full list of other causes, see the British Thoracic Society (BTS) guidelines [5] .

Assessment [5]

Make an initial assessment, looking for pointers towards a specific cause, and for any 'red flags' (see box).

History

- Nature of cough:
    - The sound - eg, brassy or seal-like (suggests tracheal/glottic irritation); bizarre or honking (suggests psychogenic).
    - Wet or dry (productive or not) - **NB**: young children don't expectorate sputum but may vomit it.
    - Haemoptysis or sputum.
- Onset, duration, time course of cough.
- Triggers.
- Does the cough disappear when sleeping?
- Other symptoms - including fever, weight loss, night sweats.
- Family history - especially atopy or respiratory disease.
- Medication. Cough is a common side-effect of angiotensin-converting enzyme (ACE) inhibitors.
- Cigarette smoke exposure or other environmental pollutants - eg, heating fuel.

Examination

- General features - fever, height/weight and any failure to thrive, clubbing, lymphadenopathy, signs of atopy.
- Upper airway - abnormal voice or crying, inspiratory stridor, ENT examination.
- Respiratory signs - dyspnoea, respiratory rate, chest auscultation.
- Observation of the cough if possible.

Pointers to particular causes of chronic cough

Onset

- Neonatal onset of cough - consider congenital malformations, aspiration, lung infections, cystic fibrosis.
- Very acute onset - inhaled foreign body.

Systemic illness

- Child well, no other symptoms - consider nonspecific isolated cough, recurrent viral bronchitis, psychogenic cough, habit cough (dry repetitive cough which disappears with sleep).
- Systemic ill health or recurrent pneumonia - consider tuberculosis, inhaled foreign body, cystic fibrosis, immune disorders, persistent bronchitis, recurrent aspiration.

Nature of cough

- Associated with wheezing or breathlessness - consider asthma, inhaled foreign body, recurrent pulmonary aspiration, cardiac disease, airways compression, tracheobronchomalacia, bronchiolitis.
- Associated shortness of breath and restrictive lung defect - interstitial lung disease.
- Cough occurs in paroxysmal spasms with an inspiratory 'whoop' - whooping cough.
- Cough is brassy, croupy or bizarre and honking - consider tracheal or glottic irritation and psychogenic causes.
- 'Wet' or productive cough (most young children do not expectorate sputum but tend to swallow it) - consider bronchiectasis or any suppurative lung condition - eg, cystic fibrosis.
- Relentlessly progressive cough - consider inhaled foreign body, lobar collapse, tuberculosis, rapidly expanding intrathoracic lesion.
- True haemoptysis (apparent haemoptysis may be related to nosebleeds, cheek biting or haematemesis) - consider pneumonia, lung abscess, bronchiectasis, retained inhaled foreign body, tuberculosis, pulmonary hypertension.

- Triggers:
    - Exercise/excitement/cold air/nocturnal cough/change in environment (eg, pets) - consider asthma.
    - Swallowing/meals - recurrent aspiration.
    - Lying down - postnasal drip, gastro-oesophageal reflux.
    - Attention - psychogenic.
- Mannerisms associated with unusual stereotypical coughs - suggest Tourette's syndrome (although the diagnosis of Tourette's syndrome cannot be made on a single tic, including isolated cough).

Red flags[5] [6]

The following features indicate a possible serious cause of cough:

History

- Family history of lung disease.
- Neonatal onset.
- Sudden onset.
- Haemoptysis (true haemoptysis - not, for example, nosebleeds or cheek biting).
- Cough with feeding, dysphagia, severe vomiting.
- Chronic moist cough with sputum production.
- Night sweats/weight loss.
- Continuous unremitting or worsening cough.

Signs

- Signs of chronic lung disease - eg, clubbing.
- Failure to thrive.
- Abnormal voice or crying, inspiratory stridor.
- Focal chest abnormality.

Investigations

Which children need investigating in primary care? [6]

Belgian primary care guidelines suggest the following strategy:

- 'Red flags' present - require specific investigations depending on the clinical picture.
- No 'red flags':
    - If fever - exclude pneumonia.
    - For immigrants - exclude tuberculosis.
    - If there are pointers to a specific cause - investigate appropriately (eg, spirometry, serology, oesophageal pH monitoring).
    - If there are no specific pointers - consider CXR.

Which investigations? [5]

BTS guidelines suggest the following strategy when investigating chronic cough:

Initial investigations:

- CXR.
- Spirometry where possible in older children ± tests of bronchodilator responsiveness or bronchial hyper-reactivity.

Further investigations:

- Obtain a sputum sample if possible - for microbiology and cytology.
- Allergy testing (skin prick or radioallergosorbent test (RAST) specific testing) may help if atopy/asthma are likely diagnoses.
- Other tests will depend on the clinical picture and differential diagnosis.

Trial of treatment:

- BTS guidelines suggest that in contrast with adults, for children with a dry cough who are well and have no specific disease pointers, empirical trials of treatment (for asthma, allergic rhinitis or gastro-oesophageal reflux) are unlikely to be beneficial and are generally not recommended.
- However, in young children, BTS suggests that, as it may be difficult to rule out asthma as a cause of coughing in young children, a trial of anti-asthma therapy may be used (eg, inhaled corticosteroids). Ensure effective delivery, adequate doses and clear recording of outcomes.
- Set a time (eg, 8-12 weeks) after which the trial of anti-asthma medication should be stopped. If the child has responded to anti-asthma therapy and the treatment has subsequently been stopped, an early relapse that again responds to treatment is suggestive of cough-variant asthma. If there is no response, asthma is unlikely.

Management[5]

- This depends on any specific cause found.
- In a well child with no 'red flags', aim to avoid invasive investigations and to explore the expectations and anxieties of parents. Persistent cough causes a significant burden in terms of repeated consultations and parental anxiety[7] .
- Remove environmental contributions if possible - eg, tobacco smoke.
- No treatment has been found to be particularly effective for isolated nonspecific cough in an otherwise well child. Reassurance is important, and it will usually subside over time.
- Antitussive drugs, other than simple cough linctus, are not generally recommended[6] .

Further reading

- Weinberger M, Hurvitz M; Diagnosis and management of chronic cough: similarities and differences between children and adults. F1000Res. 2020 Jul 22;9. doi: 10.12688/f1000research.25468.1. eCollection 2020.

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