Fourth year / Clinical Pharmacy

**Cough**

 

* Coughing is a protective reflex action caused when the airway is being irritated or obstructed. Its purpose is to clear the airway so that breathing can continue normally.
* Cough is one of the more common conditions for which patients request pharmacist assistance.
* The majority of coughs presenting in the pharmacy will be caused by a viral URTI.
* The patient with cough may also present with other symptoms that required referral to the physician for further investigations.

**Patient Assessment of cough (questions and answers)**

**Age**

* Establishing who the patient is – child or adult – will influence the choice of treatment and whether referral is necessary.

**Duration**

* Most coughs are self-limiting and will be better within a few days with or without treatment.
* In general, a cough of longer than 2 weeks’ duration that is not improving should be referred to the doctor for further investigation.

**Nature of cough**

*Unproductive (dry or tight)*

* In an unproductive cough, no sputum is produced and has no physiologic purpose.
* These coughs are usually caused by viral infection and are self-limiting.

*Productive (wet or chesty)*

* Sputum is normally produced. It is an oversecretion of sputum that leads to coughing.
* Oversecretion may be caused by irritation of the airways due to infection, allergy, etc., or when the cilia are not working properly (e.g. in smokers).
* They expels secretions from the lower respiratory tract that if retained could impair the ventilation and increases the possibility of respiratory tract infections.
* Non-coloured (clear or whitish) sputum is uninfected and we can recommend OTC products.
* Coloured sputum may sometimes indicate a bacterial chest infection such as bronchitis or pneumonia and require referral.
* Coloured sputum is described as green, yellow or rust-coloured thick mucus and the patient is more unwell usually with a raised temperature, shivers and sweats.
* Sometimes blood may be present in the sputum (haemoptysis), with a colour ranging from pink to deep red. Haemoptysis is an indication for referral.

*Chesty-Nonproductive:*

* Some patients say that they are not producing sputum and they say that they can "feel it on their chest ", in this case cough is probably productive in nature and should be treated as such

**Associated symptoms & special cases**

* If there is a recurrent night-time cough especially in children with or without wheezing, this may indicates Asthma---------------- referral for further investigations, (especially if there is a family history of eczema, asthma, hay fever … ).
* If sputum is described as frothy, and symptoms like breathlessness (especially in bed during the night) and swollen ankles, this may indicates heart failure and mitral stenosis……referral.
* Chronic cough with haemoptysis associated with chronic fever and night sweats are classical symptoms of **TB**……need referral.
* ***Croup***: usually occurs in infants, the cough is harsh, barking, and paroxysmal (occurring in bouts), and the child often has difficulties in breathing and stridor (noisy inspiration) ------------- referral for further investigations. (Note: Croup usually develops a day or so after the onset of cold-like symptoms).
* ***Postnasal Drip***: It is a common cause of coughing and may be due to sinusitis------------- referral for further investigations. (Postnasal Drip is characterized by a nasal discharge that flows behind the nose and into the throat. Patient present with swallowing mucus or frequent clearing of the throat more than usual.
* ***Chest pain***, shortness of breath (***SOB***), wheezing, Whooping---------referral for further investigations.
* Coughing during the ***recumbent*** (supine, lying down), with heartburn may indicate Gastro esophageal reflux disease (GERD) which may be improved by antacid or histamine-2 receptor antagonists (H2RA).
* ***Smoking***: if cough is related to smoking, refer the patient to primary care provider; such cough should not be self-treated with cough suppressant and/or expectorant. (Patient who smokes is more prone to chronic recurrent cough. Over time this might be develops into chronic bronchitis or emphysema).

**Medication**

* If one or more appropriate remedies have been tried without success (failed medication) ------------- referral for further investigations.
* Effective product for similar previous cough: the pharmacist should consider patient's satisfaction or dissatisfaction with specific products i.e. patient's prefera3bility.
* Drug-induced cough: e.g.:
1. Angiotensin-converting enzyme (ACE) inhibitors (e.g. captopril, lisinopril, Enalapril ……) can induce cough in about 10% of patients (especially women), the cough is usually nonproductive, occurs within the first few months of therapy-----------refer and suggest the alternative: Angiotensin II receptor antagonists (valsartan, losartan, ….).
2. The antiarrythmic agent; amiodarone.

**Treatment timescale**

* Once the pharmacist has recommended an appropriate treatment, patients should see their doctor 2 weeks after the cough started if it has not improved.

**When to refer:**

- Cough lasting 2 weeks or more and not improving

- Sputum (yellow, green, rusty or blood-stained)

- Chest pain

- Shortness of breath

- Wheezing

- Whooping cough or croup

- Recurrent nocturnal cough

- Suspected adverse drug reaction

- Failed medication

**Management**

***Non-drug measures:***

* Slowly dissolving hard candies or other lozenges in the mouth may sooth the irritated throat and decreases the dry cough. (They don’t contain an active ingredient and considered to be safe in children and pregnant women). If recommended they should be given 3-4 times daily.
* General advice to patient with cough and cold is to increase fluid intake to about 2Ls / day(about 8 to 10 glasses daily).

***OTC Medication:***

* The choice of treatment depends on the type of cough. Suppressants (e.g. pholcodine) are used to treat unproductive coughs, while expectorants such as (guaifenesin) are used in the treatment of productive coughs.
* Productive coughs should not be treated with cough suppressants because the result is pooling and retention of mucus in the lungs and a higher chance of infection, especially in chronic bronchitis.
* There is no logic in using expectorants (which promote coughing) and suppressants (which reduce coughing) together as they have opposing effects. Therefore, products that contain both are not therapeutically sound.
* The BNF gives the following guidance: cough suppressants, expectorants, demulcents, and sometimes there is a need for decongestants, antihistamines.

***Cough suppressants***

Antitussive (cough suppressants): used for dry cough.

 1-***Codiene***: present in cough mixtures

 e.g. of codeine containing cough mixtures available in Iraq are:

 Tussiram® syrup, Pulmocodin® syrup…

**S/Es**:

* Even at OTC doses codeine can cause constipation and at high doses, respiratory depression, therefore it is best avoided in patients with impaired respiratory function e.g. Asthma.
* However, in practice this is very rarely observed and does not preclude the use of cough suppressant in asthmatic patients.
* Codeine is well known as a drug of abuse and sales must be refused because of knowledge or likelihood of abuse).

 **2-*Dextromethorphan*** (Sedilar® tablet, drop, syrup)

Generally it is considered non-sedating and has fewer side effects.

Dose:

|  |  |  |
| --- | --- | --- |
| 1-5 years | 5 -12 years | Adults |
| 2.5 mg four times daily | 7.5 mg four times daily | 15 mg four times daily  |

 **3-*Diphenhydramine*** (Allermine®):

This is one of the sedating antihistamines.

The *antitussive* doses are:

|  |  |  |
| --- | --- | --- |
| 2-6 years | 6 -12 years | Adult |
| 6.5 mg every 4hours  (max. 37.5mg/day) | 12.5 mg every 4hours  (max. 75mg/day) | 25 mg every 4hours  (max. 150mg/day)  |

1. ***Demulcents***: Preparations such as glycerin, lemon and honey or Simple Linctus are popular remedies and are useful for their soothing effect. They do not contain any active ingredient and are considered to be safe in children and pregnant women. They are now the treatment recommended for children under 2 years.

***Expectorants and Mucolytics****:*

They are used for wet cough:

1-Glyceryl guaiacolate (also called Guaifenesin): Which is the only FDA approved OTC expectorant.

Doses:

|  |  |  |
| --- | --- | --- |
| 1-6 years | 6 -12 years | Adults |
| 50 mg four times daily | 100 mg four times daily | 200 mg four times daily  |

2-Bromohexine (Solvodin® syrup, and tablet), which is one of the mucolytic drugs, used for wet cough.

**Additional Constituents:**

***Theophylline:***

* Which is one of the bronchodilators, and it is available in some OTC products but it is best avoided because patients requiring medication to help with shortness of breath (SOB) or wheeze are best referred.

***Sympathomimetics*:**  (e.g. Pseudoephedrine and Phenylphrine)

* These are commonly included in cough and cold remedies for their bronchodilator and decongestant actions.
* *They may be useful if the patient has blocked nose as well as cough*, but they can increase the BP, stimulate the heart, and alter the diabetic control therefore they are not recommended for patients with: Coronary artery diseases (Angina, MI, ….), Hypertension, Diabetes mellitus, and Hyperthyroidism.

***Sedating Antihistamine:***

* Diphenhydramine, and chlorpheniramine,…., which may be added to antitussives ( combination with expectorant is illogical) and they are effective especially if the dry cough is disturbing sleep.
* S/Es: include sedation and drowsiness and anticholinergic S/Es (i.e. dry mouth, urinary retention, constipation, …..).
* They are not recommended (or used with caution) for patients with: Glaucoma or prostate hypertrophy.

**Further reading**

1. Placebo effects of cough preparations

 Antitussive probably have a limited role in the treatment of acute non-productive cough, patients should be encouraged to increase fluid intake and told that their symptoms will resolve in time on their own. If medication is required then any active ingredient could be recommended and the side effect profile and abuse tendency rather than clinical efficacy will drive choice. On this basis:

- Dextromethorphan: will be 1st line therapy.

- Codeine: will be 2nd line therapy (because of side effect profile and abuse tendency).

- Antihistamine: should not be used routinely, unless night-time sedation is perceived additional benefit to the patient sleep.

 In addition, most products to treat productive cough are probably no more effective than placebos, however, if the patient has confidence in a product's efficacy then their use should not be discourage.

1. Diabetic patient and the sugar contents of cough medicines:

 Current thinking is that in short-term acute conditions the amount of sugar in cough medicines is relatively unimportant.

(However sugar-free products are available and may be used for diabetic patients and by patients who wish to reduce sugar intake for themselves and their children as part of dental health).

1. Steam inhalations

 These can be useful, particularly in productive coughs. The steam helps to liquefy lung secretions and patients find the warm moist air comforting.

1. Fluid intake

 Maintaining a high fluid intake helps to hydrate the lungs and hot drinks can have a soothing effect. General advice to patients with coughs and colds should be to increase fluid intake by around 2 L a day.

**Sore throat**



* Throat pain generally refers to discomfort of any part of the pharynx; symptoms can range from scratchiness to severe pain.
* Most sore throat which present in the pharmacy will be caused by viral infection (90%) with only (10%) being due to bacterial infection, so the treatment with antibiotics is unnecessary in most cases.
* Unfortunately differentiation between viral and bacterial sore throat is extremely difficult.

**Patient assessment with sore throat:**

**A -Age:**

Although viral causes are the most common cause, streptococcal infections are more prevalent in school-aged children.

**B-Duration:**

Most sore throats are self-limiting and will be better within 7-10 days, therefore, sore throat lasting a week or longer should be referred.

**C- severity:**

If the sore throat is described as extremely painful, especially in the absence of cold, cough or catarrhal symptoms, then referral should be recommended if there is no improvement within 24-48 hours.

**D-Previous history:**

 Recurrent bouts of infection (tonsillitis) would mean that referral is best.

**E-Associated symptoms:**

* A cold, catarrh and cough may be associated with a sore throat. There may also be a fever and general aches and pains. These are in keeping with a minor self-limiting viral infection.

**Symptoms that may need referral:**

* *Dysphagia*: Most patients with sore throat will find it less easily to swallow (not required referral) but this has to be differentiated from actual difficulty in swallowing (dysphagia) that required referral.
* True difficulty in swallowing (dysphagia) (i.e. not just caused by pain but mechanical blockage) should be referred.
* *Hoarseness:* when hoarseness persist for longer than 3 weeks, referral is necessary.
* *Appearance of throat:* Unfortunately the appearance of throat can be the same in both viral and bacterial sore throat (Which may be normal appearance or the presence of white spots, exudates or pus on tonsils). However, marked tonsillar exudates accompanied with high temperature and swollen glands ------------- required referral.

**F- Present medication:**

* A rare complication of certain medication is agranulocytosis (suppression of WBC production in the bone marrow) which can manifest as sore throat.
* The patient will probably present with signs of infection, including fever and chills.
* Examples of drugs that cause this adverse event are: (*Captopril, carbimazole, cytotoxics, pencillamine, sulfasalazine, sulfur containing antibiotics, neuroleptics e.g. clozapine*).

**Treatment timescale**:

Patients should see the doctor if the sore throat has not improved in 1 week.

**Management**

* The majorities of sore throats are viral and are self-limiting.
* Medication therefore aims to relieve symptoms and discomfort while the infection runs its course.

A-Oral analgesics:

* Simple systemic analgesics such as paracetamol, aspirin, and ibuprofen arc effective in reducing the pain associated with sore throat.
* The patient can be advised to take the analgesics regularly to sustain the pain relief.

B-locally acting preparations :( Gargles, lozenges, pastilles, sprays):

* Sucking a lozenges or pastilles promotes saliva production, which will lubricate the throat and thus exert a soothing action.
* Gargles have a very short contact time with the inflamed mucosa and therefore any effect will be short lived. A lozenges or pastille are preferable, as contact time will be longer.
* Patient should be reminded that mouthwashes and gargles should not be swallowed (however, the potential toxicity of OTC of this type of product is low if small amount is swallowed).
* In addition, manufacturers recommendations about whether to use the mouth diluted or undiluted should checked and appropriate advices given to the patients.
* When the viral infection is the cause, lozenges that contain antibacterial or antifungal may be still useful since it soothe and moisten the throat.
* Diabetes: the mouthwashes and gargles are suitable and can be recommended. Sugar-free Lozenges and pastilles are available; however, short term use is not considered so important.

**Table: examples of ingredients present in local products for sore throat:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| comments | Pregnancy | Use in children | Likely side effects | Example |  |
|  | Neonatal respiratory depression in large dose , Avoid in third trimester | Lidocaine:>12 yearsBenzocaine: Lozenges: :>3 years Spray: >6 years | Sensitization reaction | Lidocaine and benzocaine  | Local anesthetics |
| Avoid in peptic ulcer. Caution in lactation. | Avoid in third trimesterOK | >12 yearsRinse: >12 yearsSpray: >6 years | None reportedOral rinse may cause stinging | FlubiprofenBenzydamine | Anti-inflammatory  |

*Examples of Dose:*

Benzocaine 5 mg pediatric lozenges: 1 lozenge every 3 hours when needed to a maximum of 6/ day.

Benzocaine 10 mg adult lozenges: maximum of 8/ day.

Flubiprofen lozenges: 1 lozenge every 3-6 hours when needed to a maximum of 5/ day.