CPD4dentalnurses

YOUR FUTURE IN YOUR HANDS

Medical Emergencies: Asthma and the Management of Asthma in Dental Practice

Aims: To give an overview of asthma including its aetiology, risk factors and prevalence, an overview of dental considerations that need to be taken into account when treating a patient who has asthma, and to outline of how to manage a patient who has an asthma attack in the dental surgery.

Objectives: On completion of this verifiable CPD article the participant will be able to demonstrate, through completion of a questionnaire, the ability to:

- Identify the prevalence of asthma
- Identify the categories of asthma
- Identify some dental considerations that need to be considered when treating a patient who has asthma
- Identify the drugs that are used to treat and manage asthma
- Know how to deal with an acute asthma attack should one occur in the dental practice

Introduction

Asthma is a chronic respiratory disease which affects a person's airways, the tubes that carry air into and out of their lungs (bronchi or bronchioles). People who suffer from this medical condition are sensitive to certain triggers or substances which can cause their bronchioles to become inflamed and swollen which reduces the amount of air that can pass through them. Sticky mucous or phlegm may also be produced resulting in the person coughing, wheezing and being unable to breathe. During an asthma attack the patient suffers from constriction of the bronchioles of the lungs.[1]

Asthma affects people of all ages and is the most common chronic disease among children.[2] In the UK, there are currently 5.4 million people receiving treatment for asthma. That is 1 in every 12 adults and 1 in every 11 children. Asthma in adults is more common in women than men.[3] The latest data from Asthma UK's analysis of data from the Office of National Statistics, showed that asthma deaths increased by over 33% from 2008-2018. Asthma UK highlighted that there needs to be improvements in the NHS concerning the provision of basic asthma care.[4]

The statistics for the prevalence of asthma indicate that it is likely that the dental care professional will be frequently dealing with patients who suffer from this potentially serious medical condition. It is therefore important that the dental team are fully aware of this medical condition, how to avoid potential triggers, and how to manage a patient if they have an asthma attack in the surgery.

Categories of Asthma

Asthma is more likely in individuals who have a family history of eczema or other allergies or a family history of asthma.

There are two categories of asthma:

1) Allergic (Extrinsic) Asthma

Extrinsic asthma was first described by Rackeman in 1918 and again in 1947 and refers to asthma allergens or triggers. This allergic asthma is diagnosed more often in children and is triggered by specific allergens. These include:

- Pollen
- Dust mites
- Mould spores
- Animal dander
- Allergenic foods
- Drugs and chemicals

Allergic asthma is commonly diagnosed through allergy testing. Positive skin tests can show a tendency to produce IgE antibodies in response to low doses of allergens. [5]

2) Non allergic (Intrinsic) Asthma

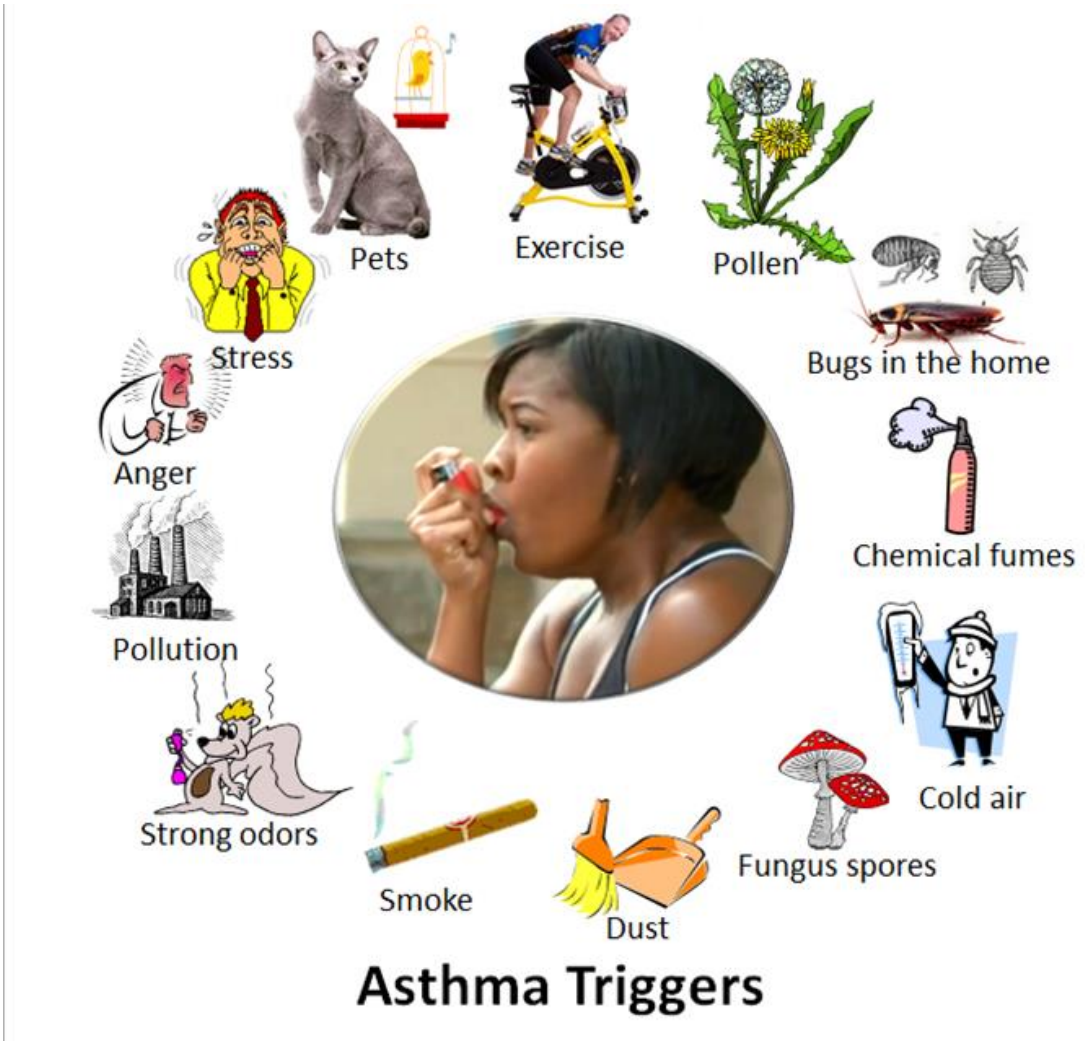
Rackeman described intrinsic asthma (now called non allergic asthma), as being caused by substances within the body. Rackeman described it as "a disease characterized by later onset in life, female predominance, higher degree of severity, and more frequent association to nasosinusal polyposis."[6]

Non allergic asthma is now considered to be asthma caused by anything other than allergens. This includes external factors such as:

- Chemicals in cigarette and wood smoke
- High humidity
- Cold air
- Strong smells
- Air pollution
- Viruses and bacteria

It also includes internal factors such as:

- Gastrointestinal reflux
- Strong emotions
- Anxiety
- Stress
- Physical exertion



Possible asthma triggers

Medications Used to Treat Asthma

Asthma medicines are usually given by inhalers, which are devices that deliver the drug directly into the airways through the mouth when air is breathed in. Inhaling a drug is an effective way of taking an asthma medicine as it goes straight to the lungs. This means that very little of the medication ends up in other areas of the body.

Treatments for asthma include:

Reliever Inhaler – Short-Acting Beta-Agonist.

This self-administered bronchodilator inhaler is often blue and works by relaxing the muscles that surround the narrow airways (Figure 1). This enables the airways to open wider, making it easier to breathe again. The most common Short-Acting- Beta-Agonist is Salbutamol (Ventolin) [7] Reliever medicine can come in different types of inhaler devices:

- Metered dose inhalers
- Breath actuated inhalers
- Dry powder inhalers

Fig.1 Reliever inhaler

Preventer Corticosteroid Inhaler

Daily preventer inhalers usually contain a small amount of steroid (Figure 2). Taken over a period of time, these inhalers help to prevent acute asthma attacks occurring by reducing the amount of inflammation in the airways. Not all asthmatics will be prescribed a preventer inhaler. Examples of preventer inhalers are Beclomethasone, Budesonide, Fluticasone and Mometasone.[8]

Fig.2 Preventer Inhaler

Long-acting Beta-Agonist and Combination inhalers

If the above therapies do not control an individual's asthma, a long acting reliever may be prescribed or an inhaler which contains combined inhaled steroid and a long-acting bronchodilator in one device (combination inhaler. Figure 3). Examples of long acting relievers are Formoterol and Salmeterol. The long-acting relieving inhaler is only used in combination with the preventer inhaler. Combination inhalers are usually purple, red and white or maroon and examples include Seretide, Symbicort and Fostair.[8]

Fig. 3: Combination inhaler

MART therapy

In some cases, patients may be recommended to use “Maintenance and Reliever Therapy.” Known as a “MART regime”. [8]

4) Preventer Medicines

If using an inhaler alone is not controlling the symptoms, the following tablets may be prescribed:

- Leukotriene receptor antagonists: tablets (also come in syrup and powder form) that block part of the chemical reaction involved in inflammation of the airways.
- Theophylline (bronchodilators): tablets that help widen the airways by relaxing the muscles around them. If asthma is still uncontrolled, regular oral steroids may be prescribed.[7]

Nebulisers

A nebuliser is usually used in an emergency situation to administer a high dose of reliever medication through a mist of medication, which is then breathed in through a mask or a mouthpiece. Some severe asthmatics may have their own nebulisers at home.[9]

Dental Considerations

Medical History

Patients with asthma should be identified by the medical history questionnaire and the frequency and type of medication will give the clinician an indication to the degree of risk that the patient is under.

Patients can be asked to make their reliever inhaler available in case of an onset of asthmatic symptoms during dental treatment. The appointment times should not interfere with the patient's medication times.

Potential Triggers in the Dental Surgery

An individual's asthma may be triggered by internal or external sources. If exposed to a trigger, the airways become irritated, which can lead to the onset of asthma symptoms. Examples of potential triggers have previously been discussed, however, there may be other potential triggers in the dental surgery.

Patients should be questioned about potential triggers. In the dental surgery, dentifrices, fissure sealants, tooth enamel dust, methyl methacrylate, fluoride trays and cotton rolls have been known to trigger attacks.[10] It is therefore important that the dental team are aware of any previous history of attacks being triggered in the dental surgery.

In addition, the patient may be allergic to sulfites which are widely used as a preservative in the food and beverage industry. Sulfites are also used as an antioxidant in local anaesthetics containing vasoconstrictors. If the patient reports allergy symptoms to sulfites, the use of local anaesthetic containing sulfites should be avoided until evaluated by an allergist.[11] Ibuprofen and other anti-inflammatory drugs have also been known to trigger attacks.

Stress and anxiety can precipitate an asthma attack. It is therefore important that patients are kept as calm as possible and that waiting times are kept to a minimum.

Oral Health

The patient should be advised in preventative oral care which will include oral hygiene instruction and dietary advice. Patients taking medication for asthma may be at risk of dental caries, dental erosion, periodontal disease and oral candidiasis (thrush).[12]

Studies have shown that prolonged use of beta-2 agonist can lead to changes in PH salivary flow. In addition, patients with asthma may be open mouth breathers. Reduced salivary flow may increase the risk of dental decay and erosion and contribute to an increase in biofilm accumulation Patients should be educated about their susceptibility to oral health problems and educated on preventative measures.

- To attend regularly for check ups
- Give patient dietary advice
- Encourage patients to drink water more often to counteract dry mouth

- A spacer device may be used to deliver their inhaled drugs directly to the airway
- Advise patients to rinse mouth immediately after using an inhaler[12]

A systematic review was published to evaluate the association between asthma and periodontal disease. The authors determined that patients with asthma demonstrated higher levels of gingival inflammation compared with healthy individuals, although this was justified by greater plaque accumulation rather than the prevalence of more severe destructive periodontal disease.

The authors concluded that the systematic review strongly suggests the association of asthma with periodontal disease, however they observed that a greater number of longitudinal studies should be encouraged in the future.[13] The full systematic review can be accessed from the link at the bottom of this article as further reading.

Dealing with a Medical Emergency

During an asthma attack breathing becomes difficult for the patient and they become distressed. The diagram below shows the difference between a normal and an asthmatic bronchiole (Figure 5). The attack may be mild, moderate or severe. If the attack is severe, cyanosis may occur with the lips becoming blue.

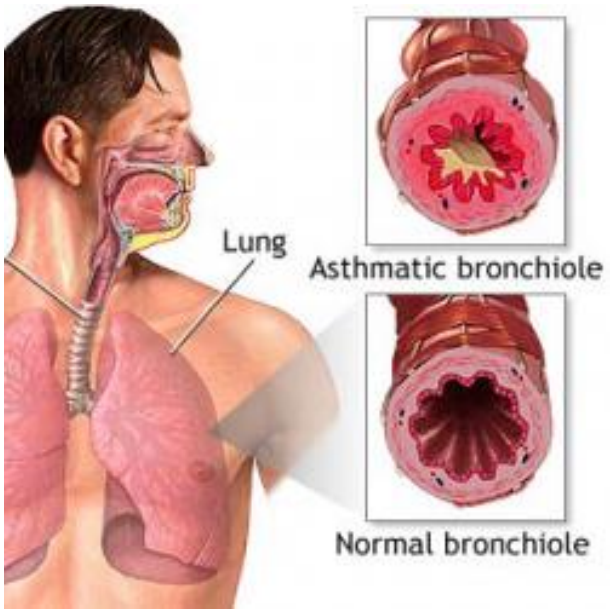


Fig. 5 Asthmatic and normal Bronchioles[14]

Signs and Symptoms

The signs and symptoms of a patient who is suffering from an asthma attack could include:

- Breathlessness
- Complaining of a tight chest
- Wheezing or coughing
- Agitated
- Increased pulse

- Talking may become difficult
- Lips and fingernails can turn blue
- Skin around neck and chest may appear tightened
- Nostrils may flare as patient attempts to breathe[15]

Clinical features of a **moderate asthma** attack in adults include:

- Increasing symptoms
- No features of acute severe asthma

Clinical features of **acute severe asthma** in adults include any one of the following:

- Inability to complete sentences in one breath
- Respiratory rate > 25 per minute
- Tachycardia (heart rate > 110 per minute)[1]

Clinical features of **life-threatening asthma** in adults include any one of the following:

- Arterial oxygen saturation (SpO2) < 92%
- Silent chest
- Cyanosis or respiratory rate < 8 per minute
- Poor respiratory effort
- Arrhythmia
- Exhaustion
- Altered conscious level
- Hypotension [16,17]

If a patient suffers from an asthma attack the following steps should be taken:

- Offer them their reliever inhaler (usually blue). Most attacks will respond after a few activations. If the patient does not have their inhaler the Salbutamol inhaler (100micograms/dose) should be used from the emergency drug kit.
- Loosen any tight clothing.
- Allow the patient to sit down but do not lie them down.
- If the patient is unable to use the inhaler effectively, additional doses should be given through a large-volume spacer device.
- **If the patient does not respond rapidly, or any of the features of severe asthma are present, an ambulance should be called.**
- If bronchospasm is part of a more generalised anaphylactic reaction and there are 'life-threatening' signs, an intramuscular injection of adrenaline should be given.
- Whilst awaiting ambulance transfer, oxygen (15 litres per minute); up to 10 activations of salbutamol inhaler using a spacer device should also be given (repeated every 10 minutes if necessary).
- If the patient becomes unresponsive be ready to start CPR procedures as necessary.[18]

Ideally, oxygen saturation should be maintained at 94-98% in most people (88-92% in individuals with type 2 respiratory failure). Although a pulse oximeter is not listed in the Resuscitation Council UK primary dental care minimum equipment list, it is recommended by the British Thoracic Society. If available, a pulse oximeter can be used to guide oxygen administration.

Conclusion

With the increase in the prevalence of asthma it is likely that the dental professional may come into contact with patients who are asthmatic. Patients with asthma may have acute attacks that are triggered by internal or external factors. It is important that the dental team are aware of any potential triggers for patients and that they know how to manage an asthma attack should it occur in the dental surgery.

Personal Development Plan and Reflective Learning

This CPD is linked to the following GDC Enhanced CPD Development Outcomes:

C. Maintenance and development of knowledge and skill within your field of practice.

Reflective learning is now a requirement of the GDC Enhanced Professional Development Scheme. As such, you will now need to answer some reflective learning questions, before your certificate is generated. These will be:

1) What did you learn (or confirm) from the activity that was helpful or relevant to your daily work and patients?
2) Comment on any changes/updates needed in your daily work
3) How has completion of this CPD article benefitted your work as a DCP?

Examples will be provided. Please remember that you need to fill this in on completion of the exam but you can also update this at any time from your CPD log. If you take a few moments to write your reflection on completion, you will have fulfilled the Enhanced CPD requirements.

Further Reading

Association between asthma and periodontal disease: A systematic review and meta-analysis

British Thoracic Society (2019) Updated BTS/SIGN national Guideline on the management of asthma

BNF/NICE Treatment of asthma

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