

Asthma

Definition

A condition caused by an allergic reaction resulting in widespread narrowing of the bronchial airways.

Asthma is a very common medical condition and can be triggered by many things, including dust, traffic fumes, pollen, stress and even the weather.

An asthma attack occurs as a result of being exposed to an asthma trigger, which causes the small airways (the bronchi and bronchioles) become narrower, or constricted, making breathing more difficult. This produces a cough and a wheezing sound, usually on expiration, and the casualty will be struggling to breathe, becoming severely distressed and developing a rapid heartbeat. The casualty may begin to turn blue (cyanosis) and death can occur if left untreated.

When oxygen is inhaled it has to pass through the bronchi and bronchioles in the lower airways to reach the alveoli of the lungs. Normally breathing is effortless and a maximum volume of air can pass in and out of the lungs with no resistance. However, this is dependent on how patent the lumen (how wide the diameter) of these tubes are.

The bronchi and bronchioles are composed of three layers, a circular ring of smooth muscle, an inner layer of ciliated lining cells, and a thin inner coating of mucous. Any of these three layers of tissue can reduce the size, and therefore the patency, of the airway.

If the smooth muscle of the outer wall contracts, this will reduce the diameter. If the cell layer lining the wall becomes inflamed, fluid will build up causing them to swell and also reduce the diameter and if the mucous layer becomes thicker this will have the same effect. In an asthma attack an exposure to a trigger will cause these events to happen, and considerable effort will be required to generate sufficient pressure in order for a breath to be taken. The air is forced out against the narrowed airways and produces a characteristic wheezing sound. The more pronounced and audible the wheeze, the narrower the airways have become. The effort required in order to breathe will produce stress in the casualty, which will make the situation worse, eventually causing a prolonged attack, or 'status asthmaticus' and will result in exhaustion, causing a drop in the breathing rate, and this could result in death.

Possible signs and symptoms

- Difficulty breathing
- Coughing
- Wheezing
- Difficulty speaking (will need to take breaths during a sentence)
- Pale, clammy skin
- Grey or blue lips and skin (cyanosis)
- Use of accessory muscles (in the neck and upper chest) to breathe
- Loss of consciousness

In the initial stages of an asthma attack, the respiration rate may actually rise. The casualty will also have an increased heart rate (tachycardia).

When a severe asthma attack is not treated successfully the casualty will become exhausted and this will result in life threatening asthma (status asthmaticus). Cyanosis will become apparent and the casualty will develop a slow heart beat (bradycardia). The breathing rate will become slower and may eventually stop.

Be prepared to start CPR if the breathing stops, or becomes 'abnormal' (less than 10 breaths per minute should be considered abnormal)

Management

The most effective way of getting a drug to the airways is to inhale it. Most asthmatics carry their bronchodilator inhalers or 'relievers' with them. The most commonly used contain salbutamol or terbutaline and are usually blue.

There should always be a blue reliever inhaler in the emergency drug box and this should be readily available for use.

Sit the casualty upright, leaning on the wall or a chair, if necessary (the dental chair is ideal). Help them to use their inhaler. (It is much easier to administer the drug successfully if they can do this themselves). Two 'puffs' should be administered initially, (the dose of salbutamol is 100mcg per puff) but this can be repeated every few minutes if the attack does not ease.

Oxygen must also be administered, using the non-rebreathing face mask.

If the amount of the drug that is absorbed via the inhaler alone is insufficient to relieve the symptoms then a spacer device should be used in conjunction with the inhaler. A spacer device allows a more effective distribution of the inhaled drug to the lungs. This device is especially useful if the casualty cannot administer their own inhaler, or if they are taking irregular breaths, as it does not rely on coordinating inspiration with the activation of the inhaler.

Asthma

Management (continued)

The Resuscitation Council (UK) recommends that dental practices should have a spacer device within their emergency drug box.

A nebuliser can be used if there is one available. Small disposable chambers can be purchased cheaply and can be attached to an existing oxygen supply for use. These devices create a 'mist' of damp air containing a higher dose of the bronchodilator which increases the dose getting through to the lungs.

If the attack is prolonged, severe, appears to be worsening, the casualty is becoming exhausted (status asthmaticus) or loses consciousness, ring for an ambulance immediately. Keep the casualty upright whilst conscious. If at any time they lose consciousness, open the airway and check for breathing.

Be prepared to start CPR if the breathing has stopped or become 'abnormal' (less than 10 breaths per minute.)

Otherwise, lay the casualty in the Recovery Position, continue giving oxygen via the non-rebreathing face mask and monitor breathing constantly whilst waiting for the emergency services.

Prevention

If a patient has asthma then it must be entered within their Medical History, including a list of possible triggers and also whether it is well controlled or not. The patient's medication is often a reliable indicator as to how severe the asthma is. Patients who only use a bronchodilator (reliever inhaler) occasionally are not likely experience an asthma attack too regularly. The patient with severe asthma may be taking tablets for the condition in addition to their inhalers, and may even have nebulisers at home. A helpful question is to ask if the patient has ever been admitted to hospital during an asthma attack.

Triggers should be avoided if possible, and those of significance in the dental practice include flowers and plants, cleaning agents (check if a specific type may set off an attack and use an alternative if possible). Analgesics (prescribed or over the counter preparations) that may have been taken for pain relief, in particular aspirin and other non-steroidal anti-inflammatory drugs such as ibuprofen.

If a patient is stressed, or worried about treatment it may be helpful if they can bring someone with them for reassurance. Alternatively the dentist may have to consider appropriate pain and anxiety control measures, which may involve the use of sedation for certain procedures.

It is unwise to undertake dental treatment if a patient's airway is already compromised, e.g. a chest infection. If a patient is breathless from rushing to the surgery they should be given time to allow their breathing rate to return to normal before any treatment is undertaken.

In all cases, if the patient is of the opinion that they would benefit from using their inhaler before treatment starts, then this should be allowed.

It should not be considered unusual for the dental staff to ask a patient who needs their inhaler regularly to use it before every treatment session, and to place it nearby in case it is required again.

