



Update on Medical emergency in dental operator - A Review

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ABSTRACT:

Medical Emergency can occur at any point in a day to day life in a dental set up. The entire dental team needs to be properly trained for such emergencies. Adequate training will result in proper management of patient and timely supportive care if needed.

The commonly occurring complications and the methods to manage them is explained in the review.

KEYWORDS: Basic life support, hyperventilation, cardiac pain, hypoglycemia, bronchodilator

INTRODUCTION :

A medical emergency is defined as a sudden or unexpected threat to the physical health or wellbeing which requires urgent assessment and alleviation of symptoms ¹. Medical emergencies have been increasing day by day in dental practice. This increase is perceived mostly in geriatric patients with existing illness ². Most of these tragic incidents is as a result of inadequate training to face emergency situations which ultimately leads to legal complications³.

United states have incorporated the emergency medical training 40 years ago but yet the students and clinicians are facing issues in coping up during any Medical emergencies⁴.

MATERIALS AND METHODS:

RISK MANAGEMENT

Risk management plays a very important aspect in dental emergency. Hence medical risk assessment is essential in dental clinics ⁵.

Preparation for an emergency

The case history taken by the medical professional at the initial stage is the first step towards prevention of any medical emergency.

- a) any predisposing factors which can lead to an unforeseen event can be avoided by a detailed case history
- b) Visual examination: any abnormalities involving the patient's skin or breathing can be perceived
- c) Conversing with the patient: one can assess the anxiety levels
- d) Vitals need to be checked and also physical well being
- e) Rectification of any need for oxygen supply to all organs.

Training

The ADA American Dental Association council has given some specification which is as follows

- 1) Certificate course on Basic life Support
- 2) Training in emergency therapy
- 3) Emergency drills ⁶.

ADA has put together a special and mandatory training for the dentists who manoeuvre general anaesthesia, conscious sedation and deep sedation ⁷.



Incidence of medical emergency

The prevalence of medical emergency is seen more in medical hospital set up but recently it is observed also in dental clinics⁸. It is seen that the dentists experience emergencies at least once in two years⁹. Hence to prevent any such incidences some of the common dental emergencies and their management will be discussed in this review.

DISCUSSION:

Emergency drugs and Equipment's

The drug list is given by the Resuscitation Council

Drug

Oxygen (inhalation), Glyceryl trinitrate (GTN) spray (400 micrograms per actuation) (sublingual) Dispersible aspirin (300 mg) (oral), Salbutamol aerosol inhaler (100 micrograms per actuation), Adrenaline (1:1000, 0.5 mg) (IM), Glucagon injection (1 mg) (IM), Oral glucose solution/gel, Midazolam 10mg Or 5mg/ml (buccal or intranasal)

Few of the other items are as follows:

- a) Aromatic ammonia
- b) Oxygen
- c) BP machine
- d) CPR Pocket Mask
- e) BP Machine
- f) Bag and mask apparatus
- g) Sterile syringes and needles
- h) Tourniquets
- i) High-volume suction
- j) Blood glucose measurement device¹⁰.

Medical emergency seen usually in dental set up are the following

- a) Syncope
- b) Postural hypotension
- c) Allergic reaction
- d) Adrenal insufficiency
- e) Hyperventilation
- f) Status asthmaticus
- g) Status epilepticus
- h) Cardiac pain

1.Syncope

Vasovagal Syncope is the loss of consciousness and it is most commonly seen in dental practice and addressed as fainting.

When the collapse is sudden and unknown. The patient is made to lie on a flat surface and legs raised, which will ensure the patient to get back consciousness. Airway, Breathing & Circulation should be evaluated. In case pulse is not felt it indicates cardiac arrest and hence



CPR should be started immediately and respective Emergency response system should be alerted.

In case there is palpable pulse, hypoglycaemia is suspected and accordingly treatment is continued ¹¹.

a) Glucagon

In a hypoglycaemic patient where the patient is unconscious this is the drug of choice which can be administered (IM). The adult dose is 1mg and 0.5mg for patient below 20kg. In case of a dental emergency where IV line is not set down, glucagon is the drug of choice 50% Dextrose intravenously is the ideal drug in case of severe hypoglycaemia ¹².

2.Postural hypotension

Management of postural hypotension

Unconscious patient is made to lie in a supine position with legs raised until the patient is receptive and the airway has to be sustained.

In case the patient is in unresponsive state oxygen should be administered using bag valve mask with 10-15 litres per minute.

In case the patient is in conscious state Oxygen administration to be done using full face mask at the rate of 10 to 15 litres per minute ¹³.

3.Allergic Reaction

When exposure to foreign body occurs, there is a sudden reaction seen which results in the release of certain chemical mediators which in turn causes clinical symptoms.

Clinical Signs

Itching, Rashes, swelling, bronchospasm

Management

First step is to identify the causative agent. Next is to make the patient sleep in the supine position with elevated legs and administer high flow of oxygen. If symptoms are persistent even after administration of oxygen, Adrenaline 0.5mg IM/IV is given ¹⁴.

4.Adrenal insufficiency

In the case of primary adrenal insufficiency, the patient should bring their emergency kit to all appointments, as well as their physician consent letter which provides medical treatment instructions. If the patient has arrived with the emergency kit of hydrocortisone then the same can be administered through (IM) route.

The required dosage in case of Adults: 100 mg.

The dose for children is 50mg and infants is 25mg ¹⁵.

5. Hyperventilation

Anxiety is the main cause during a dental appointment for hyperventilation.

Signs and symptoms

- a) Sudden rapid breathing
- b) Dizziness
- c) Breathlessness



d) Anxiousness

Hyperventilation is mostly seen commonly in young adult females. It is rarely seen in elderly. In case there is such symptoms in elderly, Heart disease or pulmonary disease can be suspected.

Management

Detailed case history before treatment is important.

Antianxiety drugs such as diazepam is administered in severe case ¹⁶.

6.Status asthmaticus

The asthma attack which is in a continuous state.

Signs and symptoms

Increased heart rate, abnormally rapid breathing, Increased mucous secretions.

Prevention and Management

a) Detailed Medical history

b) Inhalers to be brought at every appointment. Prophylactic use is best advisable. c)

Appointment should be either late morning or afternoon.

Management

Administration of Oxygen

The oxygen can be administered either by nasal cannula, nasal hood or face masks. The flow rate should be 5-7 L/min.

Drug treatment:

Step wise regimen should be followed.

- a) Use of inhaled bronchodilators like salbutamol or terbutaline (dose-100-200 mg). Sodium cromoglycate is being used as steroid sparing drug.

Stepwise management includes:

- a) long acting beta 2 receptor antagonist (salmeterol or formoterol)
- b) Oral theophylline
- c) Inhaled ipratropium bromide
- d) Sodium cromoglycate
- e) Addition of oral steroids like Prednisolone (dose-20-30 mg/day).

For Status Asthmaticus Administration of O₂ (40-60%) through mask Drug management includes IV bronchodilator i.e. Aminophylline (250-375 mg) or IV Salbutamol. 100 mg IV hydrocortisone. 0.3 mg IV epinephrine ¹⁷.

7.Status epilepticus

All patients with epilepsy should have a consent before the dental treatment followed by a care plan In case any epileptic episode.

Following is the recommended dosage In case the patient develops seizures which lasts 5minutes and longer

1.Buccolam 2.5mg contains Midazolam hydrochloride 5mg/1ml given oromucosally

They come in prefilled syringes of 2.5mg,5mg ,7.5mg and 10mg.



2. Epistatus 10mg contains Midazolam Maleate 10mg /1 ml ¹⁸.

8. Cardiac pain

(Angina)

It occurs due to imbalance between the blood supply of myocardium and oxygen demand. Angina is precipitated by any type of stress or exposure to cold. It usually lasts for one minute to five minutes and gets relieved by taking rest or by the administration of nitrates (GTN).

Management

If patient shows any signs and symptoms of angina for e.g. patient complains of pain in the chest or has radiating pain from the chest to the shoulder, immediately stop the procedure. Make the patient to sit in upright position and start oxygen. Give GTN tablet to the patient to be taken sublingually and wait for 10 minutes. If the patient does not recover then immediately transfer the patient to the nearby hospital for the medical treatment ¹⁹.

CONCLUSION AND OUTLOOK:

Despite the fact that medical emergencies are growing concern in dental settings, the topic of emergency care should be taught more to the students in their dental school education to teach them basics of medical emergencies and consider including training courses like basic life support and cardio pulmonary resuscitation in their regular curriculum ²⁰.

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