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Research Article

UNDERSTANDING SYNCOPE- THE COMMON MEDICAL EMERGENCY IN THE DENTAL OFFICE

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ABSTRACT

Dentists in clinical practice dread the thought of having a medical emergency in their operatory. Various individual surveys throughout the world, regard unconsciousness as the most common medical emergency that a dentist has already faced or likely to face in his tenure of practice. Skillful handling of an emergency on the Dental Chair, not only depends on Responding to the Emergency, But identifying the likelihood of an Emergency in the first place. To identify an Emergency the Practitioner should be thorough with the Pathophysiology of the precipitating attack, hence gaining an upper hand in the Prompt Recognition and Response to a Medical Emergency. This paper is a compilation of such details, which may help in better handling of Unconsciousness in the dental office.

INTRODUCTION

Time to Time controversies crop up regarding a medical emergency in a Dental office and how its failed timely intervention progresses to morbidities or in worst cases mortalities. Syncope can be encountered by anyone in a clinic, a patient, a doctor, office crew or even the patient's attendant. Medical advancements have significantly increased life expectancy of the patient. This means that dental practitioners are in a position to handle the health care needs of potentially 'at-risk' patients – many of whom have chronic disorders, but are merely being controlled or managed, not cured. MC Carthy termed these persons "the walking wounded, accidents looking for a place to happen". However a statement by Goldberger "When you prepare for an emergency, the emergency ceases to Exist", emphasizes that understanding and promptly recognizing and responding to emergencies may not only be a protective armor to the dentist but also to the patient. The ultimate Aim in the Management of an Emergency is the "PRESERVATION OF LIFE" (Stanley F. Malamed, 2009). Mosby's Medical dictionary describes Unconsciousness as a state of complete or partial unawareness or lack of response to sensory stimuli as a result of hypoxia caused by respiratory insufficiency or shock; from metabolic or chemical brain depressants such as drugs, poisons, ketones, or electrolyte imbalance; or from a form of brain pathologic condition such as trauma, seizures, cerebrovascular insult, brain tumor, or infection (Antti Revonsuo, 2009). The description appears wholesome with broad description of all etiologies that may lead to unconsciousness. Malamed in his textbook on "Medical Emergencies" clearly demarcates states of Unconsciousness and Altered Consciousness, where the latter refers to a changed overall pattern of conscious experience, or as the subjective feeling and explicit recognition that one's own subjective experience has changed (Mark Greenwood, 2009). It represents a clinical presentation of a conscious person acting "strangely". Actual unconsciousness in a dental setting can be encountered only in (Stanley F. Malamed, 2009).

- Vasodepressor Syncope
- Orthostatic hypotension
- Acute Adrenal insufficiency

The most common cause of loss of consciousness in a dental practice is vasovagal syncope (fainting) (European Heart Journal, 2009; Jamil Mayet and Alun Hughes, 2003) .If the recovery is not rapid other possibilities should be considered, such as myocardial infarction, bradycardia, heart block, stroke, hypoglycemia or anaphylaxis.

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Typical syncope is brief. Complete LOC in reflex syncope lasts no longer than 20 s in duration. However, syncope may rarely be longer, even as much as several minutes. In such cases, the differential diagnosis between syncope and other causes of LOC can be difficult (Qi Fu and Benjamin, 2014)

SYNCOPE

Syncope is a temporary loss of consciousness due to transient global cerebral hypoperfusion characterized by rapid onset, short duration, and spontaneous complete recovery. The predisposing factors in a dental setting that increase the likelihood of syncope is

- Stress (due to fear factor / anxiety)
- Impaired physical status
- Administration / ingestion of drugs

Analgesics and anti anxiety drugs produce CNS depression and hence influence the level of consciousness. Syncope may at times be preceded by a prodromal period in which various symptoms (e.g. lightheadedness, nausea, sweating, weakness, and visual disturbances) warn that syncope is imminent. In most cases, however, LOC occurs without warning (European Heart Journal, 2009).

Pathophysiology of Syncope

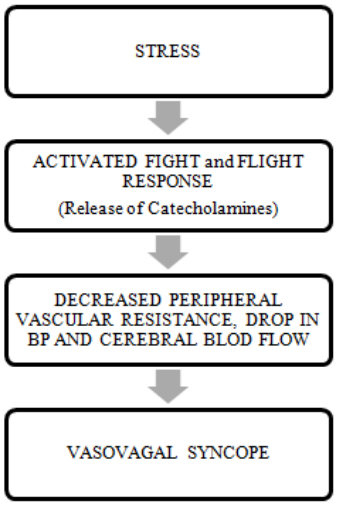
A drop in the systemic blood pressure (BP) to 60 mmHg or lower with an associated decrease in global cerebral blood flow acts as the basis of syncope. Blood Pressure as universally known is determined by cardiac output (CO) and total peripheral vascular resistance (Yuri Zilberter, 2012).A fall in either can cause syncope, but a combination of both mechanisms is often present. Individually or in combination they progress to constriction of cerebral vessels as carbon dioxide is lost through hyperventilation. Occlusion or narrowing of the internal carotid or other arteries to the brain follows, which will lead to life threatening ventricular dysrhythmias (Prasad *et al*., 2012). A sudden cessation of cerebral blood flow for as short as 6–8 s has been shown to be sufficient to cause complete LOC.

The brain requires continuous supply of oxygen and glucose. Without oxygen, glucose can be metabolized into lactic acid to provide limited energy, but this source cannot fulfill the brain's requirements for more than a few seconds, rapidly leading to devastating effects (Walter Kloeck, 1997). This is the reason why Management of syncope is always aimed at increasing the supply of well oxygenated blood to the brain. Loss of consciousness is accompanied by generalized decrease in skeletal muscle tone. Of importance is the tongue, which loses its muscle tone and, falls posterior into the hypo pharynx due to gravity.

This inadvertently causes complete or partial airway obstruction, especially when the head of the patient is flexed or in the mid position (Lalit and Tyagi, 2009). Complete air way obstruction in which the victim becomes anoxic, leads to irreversible neurologic damage within 4 to 6 minutes and to cardiac arrest within 5 to 10 minutes" (Michele Brignole, 2008) Chemical or metabolic derangements can also provoke syncope (Goldstein, 2010).In these situations consciousness cannot be regained until the underlying chemical/ metabolic cause is corrected.

'Vasovagal' Syncope (VVS)/ 'the common faint' is mediated by emotion or by orthostatic stress (Magdalena Cholewa, 2012). Stress whether emotionally triggered (as in fear) or sensorially triggered (Unexpected pain) activates the body's fight and flight response, releasing increased amounts of catecholamines, epinephrine and norepinephrine into the circulatory system This in turn prepares the individual for increased muscular activity.

However in situations, as in the dental chair, when the body's planned muscle activity does not occur, the diverted large volumes of blood into skeletal muscles causes significant pooling of blood with decreased return of blood to the heart which leads to a relative decrease in circulating blood volume, a drop in arterial blood pressure, and a decrease in cerebral blood flow, with the fate of syncope



CLINICAL MANIFESTATIONS OF SYNCOPE

Presyncope

Due to the above mentioned alterations the patient in the erect or sitting position experiences

- a feeling of warmth in the neck and face,
- Becomes pale, and sweats excessively, particularly in forehead area.
- As it continues pupillary dilatation, yawning, hyperpnoea (increased depth of respiration), and coldness in the feet and hands are noted.
- Both BP and Heart Rate become acutely depressed.
- Patient experiences disturbed vision, and becomes dizzy.

This situation can be reversed if the emerging emergency is noticed by the treating dentist and patient immediately shifted to the Trendelenberg position. (Supine with feet higher than head by 15° - 30°.)

Syncope

With the LOC

- Irregular/ Abnormal breathing /ceasation of breathing entirely (respiratory arrest/ apnea)
- Pupils dilate.
- Convulsive movements and muscular twitching of facial muscles and extremities are common.

- Bradycardia (heart rate of less than 50), Hypotension (as low as 30/15 mm of Hg), with weak and thready pulse, generalized muscle relaxation that commonly leads to partial or complete airway obstruction. Fecal incontinence may occur at times.

Once patient is placed in a supine position with the legs elevated slightly, the duration of syncope is brief ranging from few seconds to few minutes. If the patient remains unconscious for more than 5 minutes after proper positioning and managing, or if the patient does not undergo complete clinical recovery in 15 – 20 minutes causes other than syncope have to be considered.

Post Syncope

In the post syncopal phase, the patient may demonstrate pallor, nausea, weakness and sweating all of which can last from a few minutes to several hours. Immediate post syncopal phase may be accompanied by short period of confusion and disorientation. Arterial B P and heart rate starts rising towards the baseline

Management of syncope

- Discontinue treatment.
- Unfold the dental chair, lift the lower limbs
- Administer oxygen – 2–5 l/min (at least open thewindow).
- Loosen tight clothing, take the glasses off.
- Assess the pulse, arterial blood pressure, state of consciousness.
- If the patient does not regain consciousness:
- apply basic resuscitation procedures;
- Call an ambulance.

It should be kept in mind that a stop in blood supply to the brain longer than 5–15seconds causes convulsions, regardless of etiology.

Conclusion

Thus the goal in every case should be to early identification of a developing syncope in order to manage it appropriately hence avoiding a major medical crisis for the patients and the attending Dentist in concern.

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