

MEDICAL EMERGENCIES ENCOUNTERED IN DENTAL CLINICS IN NORTHERN BIHAR, INDIA.

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ABSTRACT:

Objectives: Medical emergencies in the dental clinic, though relatively infrequent, remain a critical concern due to their unpredictable nature and potential for serious consequences. The present study was to evaluate the the medical emergencies encountered in various dental clinics in northern Bihar, India. **Methods:** Self-administered questionnaires were distributed to randomly selected sample of 140 dentists working in private and government dental clinics. Dentists from different district of the northern Bihar were approached, and at least two visits were made to achieve a maximum response rate. Dental practitioners with <2 year of clinical experience were excluded from the study. **Results:** Out of 140 dentists, 100 returned the completed questionnaires yielding a response rate of 71.43%. out of 100 respondent dentists, the average age of the respondents was approximately 33 ± 8.42 years. Male (62%) respondents were greater than female (38%) respondents. It was highly statistically significant differenced ($p=0.0007$). Average experience of the dentists in clinical practice was 8.6 ± 6.5 years. 61(61%) of dentists reported having encountered any medical emergency in their clinics. Out of 61 dentists who reported medical emergency. Among them, Vasovagal syncope was encountered by 33(54.09%) and hypoglycemia (45.09%) were the most common emergency. A total of 104 medical emergencies were encountered. Oxygen (80%), adrenaline (75%) and glucose (72%) were the most common emergency kit found in dental clinic. 55.74% had handled the emergency cases themselves, 31.15% had consulted a physician. 11% of the dentists were the excellent knowledge of CPR. 36% and 39% were very good and fair knowledge of CPR. **Conclusions:** A proper standard operating procedure (SOPs) should be prepared and followed in all dental set-up. And all the dentist should have to be trained and updated their norms from time to time. Periodic seminars and hands-on workshops should have to be conducted to get both theoretical and practical knowledge about the management of emergency situations.

KEYWORDS: Dental clinic, Medical emergency, Syncope, CPR

INTRODUCTION

Medical emergencies in the dental clinic, though relatively infrequent, remain a critical concern due to their unpredictable nature and potential for serious consequences. Medical issues that a dentist may face during practice include cardiac abnormalities, diabetes mellitus, bleeding disorders, neurological disorders, and respiratory problems among other diseases. Obtaining detailed medical history is, henceforth, a prerequisite in this regard as each labelled medical condition is capable of affecting dental treatment in a different way [1]. Moreover, multiple drug interactions if not handled carefully may lead to unnecessary morbidity and mortality. To execute safe management of patients with underlying medical history, dentists should be equipped with not only knowledge about basic life support (BLS) but latest evidence-based treatment options as well. Also, honing of skills associated with delivery of first aid should be vital [2].

Although multiple factors account for the level of readiness required to manage medical emergencies in a particular dental setup, all dental practices must be equipped at basic level [3]. Fortunately, most of the severe medical emergencies that can occur during dental practice are rare [2]. Although uncommon in dentistry but serious fatal emergencies can be fall. Literature shows that a medical emergency is faced, at least once every year by most dentists [4,5]. Evenif this unfortunate even to occurs, it is most likely to take place in the department of oral and maxillofacial surgery [6]. As far as types of emergencies are concerned, the most common emergencies reported were syncope and cardiac events [6,7]. Their initial management, though not complex, requires knowledge and practice.

Possible causes of unconsciousness in dental office are vasodepressor syncope, drug administration/ingestion, orthostatic hypotension, epilepsy, hypoglycemic reaction, acute adrenal insufficiency, acute allergic reaction,

acute myocardial infarction, hyperglycemic reaction, and hyperventilation syndrome [8]. The most common cause for the loss of consciousness in the dental office is simple fainting under stress. A medically compromised patient will have a more serious reaction to stress (both psychological and physiological) than a healthy counterpart undergoing the same procedure. Most drugs used in dental treatment are central nervous system depressants and have the potential to induce the loss of consciousness [9]. The most common time of occurrence of vasodepressor syncope is during or immediately following the dental local anaesthetic injection. Hence, to cover all the aspects of preparedness in dental teaching hospitals, insight of current situation is mandatory. Objective of the present study was to evaluate the medical emergencies encountered in dental clinics in northern Bihar, India.

MATERIAL & METHODS

The present study was conducted in the Department of Oral and Maxillofacial Surgery, Mithila minority Dental College and Hospital, Darbhanga, Bihar, India during a period from January 2025 to November 2025.

A total of 140 dentists who working in public and private dental clinic in northern Bihar were randomly selected for the study.

The questionnaire was prepared. Self-administered questionnaires were distributed to randomly selected sample of 140 dentists working in private and government dental clinics.

Dental practitioners with <2 year of clinical experience were excluded from the study. Dentists from different district of the northern Bihar were approached, and at least two visits were made to achieve a maximum response rate.

The questionnaire consisted of 13 questions in four sections:

- Section one had five questions (1–5) on demographics: The number of years in dental practice, the type of dental clinic (private or government), and the basic academic qualifications of dentists.
- Questions 6 through 8 were on the frequency and type of medical emergencies encountered by the dentists in their dental practice in the last 3 years. The list included vasovagal syncope, orthostatic hypotension, asthmatic attack, hypoglycemia, heart-related problem, adverse drug reaction, fits or seizures, foreign body aspiration, and any other medical emergencies. The questions also included whether the emergency situation was dealt with by the dentists themselves, whether they sought help from a physician or another dentist or referred the patient to a hospital using an ambulance.
- Questions 9–11 asked about the dentists' competence in performing CPR, the quality of CPR courses offered of emergency kits in the clinics.
- Section four, consisting of questions 12 and 13 dealt with the availability of basic emergency drugs in dental practices, and the confidence the dentists had in administering these drugs.

STATISTICAL ANALYSIS

All data was tabulated and percentages were calculated. It was analyzed with the help of IBM SPSS version 26 software. Mean and standard deviations were observed. Chi-squared test was applied. P-value was taken less than or equal to 0.05 ($p \leq 0.05$) for significant differences.

RESULTS

Out of 140 dentists, 100 returned the completed questionnaires yielding a response rate of 71.43%. out of 100 respondent dentist, the average age of the respondents was approximately 33 ± 8.42 years. The sample comprised greater number of male (62%) as compared to female (38%) respondents. It was highly statistically significant differenced ($p=0.0007$). About 64% of the dentists worked in private dental clinics and 36% in government dental clinics. It was highly significant differenced ($p=0.0001$). The majority of the dentists (86%) had obtained bachelor's degree in dental surgery, and 14% had MDS. Average experience of the dentists in clinical practice was 8.6 ± 6.5 years.

61(61%) of dentists reported having encountered any medical emergency in their clinics. Out of 61 dentists who reported medical emergency. Among them, Vasovagal syncope was encountered by 33(54.09%) of the dentists, making it the most common emergency. This was the most common medical emergencies. About 45.09% of the dentists handled hypoglycemia that was the second most common emergency, and least frequency 4.92% had to deal with foreign body aspiration. A total of 104 medical emergencies were encountered by dentist in dental clinic in past 2 years.

Table.1. Medical emergencies encountered in dental clinics as reported by dentists (N=61)

Medical	No. of emergencies	Percentage
Orthostatic hypotension	12	19.67%
Adverse drug reactions	4	6.56%
Vasovagal syncope	33	54.09%
Asthmatic attack	6	9.84%
Hypoglycemia	28	45.90%
Foreign body aspiration	3	4.92%
Other medical emergencies	4	6.56%
Seizures	9	14.75%

Heart-related problems	5	8.2%
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Of the responding dentists, 55.74% had handled the emergency cases themselves, 31.15% had consulted a physician, 4.92% had called another dentist for help, and 8.19% had called an ambulance.

Table.2. distribution of how dentists managed medical emergencies in dental clinics (N=61).

Dentists managed medical emergencies	No. of Dentist	Percentage
Dentist called another dentist	3	4.92%
Dentist called an ambulance	5	8.19%
Dentist consulted a physician	19	31.15%
Dentist handled emergency himself	34	55.74%

In response to the question about the evaluation of CPR courses, 11% of the dentists regarded them as excellent; 36% thought they were very good, 39% stated that the CPR courses were fair, and 5% perceived them poor and 1% was very poor.

Table.3. Dentists' opinion about the CPR courses they had attended (N=100).

Rating of CPR courses	No. of dentist	Percentage
Excellent	11	11%
Very good	36	36%
Fair	39	39%
Poor	5	5%
Very poor	1	1%

Most of the dentist (80%) had oxygen as emergency kits. Adrenaline, glucose, Diphenhydramine, Aspirin, Diazepam, Nitroglycerine, Salbutamol and Glucagon were found in 75%, 72%, 30%, 28%, 26%, 21%, 17% and 15% of dentist respectively in dental clinic as emergency drugs.

Table.4. Distribution of availability of various drugs in dental clinics (N=100).

Drugs	No. of dentist	Percentage
Glucagon	15	15%
Salbutamol	17	17%
Nitroglycerine	21	21%
Diazepam	26	26%
Aspirin	28	28%
Diphenhydramine	30	30%
Glucose	72	72%
Oxygen	80	80%
Adrenaline	75	75%

DISCUSSIONS

Medical emergencies in a dental hospital can be alarming to any clinician, but these situations become relatively less alarming with adequate precautions and necessary training [10]. Serious medical emergencies are not common in dental practice, but a dentist must be equipped to handle such events. Dentistry is a health science profession that should focus on the whole patient instead of being limited to the oral cavity. However, a student's minimal knowledge about medical emergencies and their etiology causes feelings of insecurity, dissatisfaction, and a limited appreciation of the dentist's responsibility [11].

Medical emergencies represent a significant challenge due to their potential for rapid deterioration and serious patient harm if not managed promptly and effectively. These emergencies can range from benign vasovagal syncope to life-threatening conditions such as myocardial infarction, anaphylaxis, and airway compromise. Syncope is the most frequently reported emergency encountered in dental practice, followed by hypoglycemia, allergic reactions, seizures, and cardiovascular events, underscoring the spectrum of possible acute presentations during routine dental care [2].

In the present study, 61% of the dentists encountered medical emergencies in dental clinics in the northern, Bihar of India. The most common medical emergency reported in our study was vasovagal syncope. This is consistent with results reported by previous studies [12,5,13]. In contrast to a Brazilian study[5] which identified orthostatic hypotension as the second most common medical emergency, hypoglycemia was the second most commonly reported emergency in our study.

A small proportion of the dentists (4.92-8.2%) observed life-threatening medical emergencies such as foreign body aspiration, adverse reactions, asthmatic attack, and cardiac problems. Nevertheless, there is a pressing need for dentists to be sufficiently trained to manage medical emergencies.

Nearly half of the respondents (47%) in the present study were skilled in performing CPR on the patients. Arsati et al. [5] observed that 43% of Brazilian dentists were competent in performing CPR. Similarly, Gupta et al. [14] found that although one-third of Indian dentists had received CPR training, they were not adequately prepared to

perform it. In our study, about 11% of the respondents were performed excellent the quality of CPR. 39% were judged to be fair. 5% and 1% dentist were poor and very poor respectively.

Many respondents described being trained in their undergraduate course of studies to perform CPR while only few were trained in IV access and use of emergency drugs. Almost same response was recorded from responders who had a postgraduate degree. On the contrary, another study reported that only about half of the respondents were trained in emergency management such as (BLS) basic life support [13]. This points toward the need to revise curriculum to equip new graduates with basic life-saving proficiencies.

The results of our study established that almost one-third of the dentists were unable to handle emergency situations. Similarly, about 20% of British dentists were not well-prepared to manage emergencies [15].

75% of German dentists kept oxygen, [16] 63% of Australian dentists had oxygen in storage, and 22% kept adrenaline [17]. The present study found that 80% of the dentists kept oxygen, 75% had adrenaline, and 72% had glucose in their dental clinics. However, one-fourth of them had no confidence in using emergency drugs. Similar to the results obtained by Muller et al., [16] about 75% of the dentists in our study maintained emergency kits in their dental clinics. Atherton et al. [15] observed that 80% of the general dental practitioners in the UK were likely to possess emergency equipment and drugs.

The possible reason for the lack of competence in performing CPR, managing medical emergency and administering the drug is that most dentists working in Bihar had not taken different courses and acquired varying degree of skills in managing emergency situations.

A greater percentage of dentists working in private dental clinics encountered emergency situations than those in the public sector. Besides, those working in government clinics might have access to better facilities, advanced courses and/or continuing education courses. Compared with dentists working in private clinics, a higher proportion of public dentists consulted physicians. The reason for this might be the fact that government dental clinics are frequently located in hospitals where physicians may be easily available for consultation for the management of emergencies whereas private clinics are usually stand-alone dental centers without other medical care providers.

A similar cross-sectional study in the UK which used postal questionnaire reported a response rate of 74% [15]. In the present study, the respondents (71.43%) were to ensure their maximum participation. Though the response rate was satisfactory, it was slightly lower than expected. This is probably because the dentists were busy in their clinics, or they were not interested in participating in the study. The dentists in our study were asked to mention the emergencies encountered in the last 2 years. This may have resulted in recall bias, though, it allowed for more data to be collected [18].

Early correct intervention in a medical emergency can prevent further deterioration and possibly even death [19]. As a matter of fact, the unlikely occurrence of death in most medical emergency situations is due to improper management of the scenario and failure of a prompt, correct reaction to the existing situation. Many people, including partially trained professionals, tend to become more anxious and become psychologically disturbed. This basic human reaction prevents the persons to act further and ultimately leads to human fatality [20].

A medical emergency situation may arise at any time and as a proper norm to follow it. Also, it is technically necessary to get updated with all precautionary measures from time to time [21]. Many untrained people tend to mislead and follow wrong protocols which at times lead to severe irreparable damages. They should be well trained, and a good experience can shape their interventional approaches fair enough to be better [22]. A proper standard operating procedure (SOPs) has to be prepared and followed in all dental set-up, and it has to be made aware to all people involved in it [23]. And they have to be trained keenly with no deviations and should be updating their norms from time to time. Periodic seminars and hands-on workshops have to be conducted to get both theoretical and practical knowledge about the management of emergency situations [24].

CONCLUSIONS

The present study concluded that the vasovagal syncope, hypoglycemia and orthostatic hypotension were the most common medical emergency seen in dental clinic. Oxygen, adrenaline and glucose were the most common emergency drugs found in dental clinic in northern Bihar. Some of the dentists are unable to handle emergency situations and fair knowledge of CPR. Therefore, a proper standard operating procedure (SOPs) should be prepared and followed in all dental set-up. And all the dentist should have to be trained and updated their norms from time to time. Periodic seminars and hands-on workshops should have to be conducted to get both theoretical and practical knowledge about the management of emergency situations.

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