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Knowledge, Attitude and Practice of Dental Interns and Postgraduates towards Managing Medical Emergencies in Dental Chair

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Abstract

Background and Aim: Medical emergencies can happen habitually in dental setting. It is ultimately a dentist's responsibility to foresee the situation and manage it effectively. The aim was to assess the knowledge, attitude, and practice of dental interns and postgraduates regarding managing medical emergencies in dental chair.

Materials and Methods: A cross-sectional study was conducted for a period of 6 months from June 2021 to November 2021 on postgraduates and dental interns studying in dental colleges in and around the Chennai city. A pre-validated questionnaire consisting of 20 close-ended questions was circulated through Google forms. It consisted of questions on experience of medical emergencies encountered by interns during their graduation, knowledge about the essential drugs and equipment, amount of medical emergency training undertaken by participants, and preparedness of interns in handling of medical emergencies. Extracted data were statistically analysed by the Chi square test.

Results: Of 217 participants, only 50.63% of interns and 49.37% of postgraduates had good knowledge about drugs used in medical emergencies; 71.65% of interns and 28.35% of postgraduates had come across medical emergencies and were confident enough in handling them during their practice. Also, 64.79% of interns and 35.21% of postgraduates were well informed about treating patients with airway obstruction, haemophilia, diabetes, epilepsy, spontaneous bleeding after extraction, acute asthmatic attack, and adrenal crisis.

Conclusion: The majority of postgraduates had a good knowledge about management of medical emergencies in dental chair while the interns lacked confidence in handling some of the medical emergencies.

Key Words: Attitude of Health Personnel; Cardiopulmonary Resuscitation; Emergency Medical Services; Practice Management, Dental

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Introduction

A medical condition that demands prompt treatment is a medical emergency. Medical emergencies may occur in any form at any instance. Hence, when patients walk into a dental clinic, there are high possibilities for

occurrence of medical emergencies to anyone irrespective of one's health condition [1].

Generally, medical emergencies can be anticipated by taking meticulous medical history, performing proper clinical examination with appropriate treatment planning, and alterations as required. Regardless of the efforts to minimize such situations, medical emergencies may occur on dental chair [2].

Medical emergencies in dental care set up include syncope, epilepsy, myocardial infarction, bronchospasm, hypoglycemia, anaphylaxis, etc., but they are not limited to only these emergencies. Cases have been reported of patients dying on dental chair, because of these serious, potentially fatal medical emergencies and the reason being lack of knowledge and inadequate training of practitioners in managing such emergency situations [1,2].

As one graduates from a dental school as a dental health professional, it is their fundamental responsibility to provide spontaneous, effective and successful management of medical emergencies occurring in dental clinic. Moreover, dental health professionals are supposed to render painless and safe dental procedures and to be prudent to refrain from offering unethical treatments to patients, when they graduate from dental college [2,3].

Nowadays, people are aware of medical negligence. Failure to handle emergency situations and provide effective treatment might lead to legal proceedings such as lawsuit against the practitioner. Thus, it is imperative for any dental school to provide extensive knowledge and substantial training on managing emergency situations pertaining to dental practice [3].

Therefore, dental practitioners must be able to acknowledge and communicate adequately about the potential medical conditions of each and every individual patient walking into the clinic. Furthermore, they should have sufficient knowledge on oral healthcare and possible interactions with medical conditions [4,5].

Thus, the aim of this study was to gauge the knowledge, attitude and practice of dental interns and postgraduates towards managing and supervening medical emergencies occurring in dental office.

Materials and Methods

A cross-sectional study was conducted for a period of 6 months from June 2021 to November 2021 on postgraduates and dental interns studying in dental colleges in and around the Chennai city. Ethical clearance was obtained from the Institutional Review Board (2811A/IEC/2021).

The participants of the study voluntarily completed a questionnaire containing 20 pre-validated close-ended questions circulated through Google forms. Questions were based on knowledge, attitude and experience regarding medical emergencies encountered during practice, the amount of medical emergency training undertaken by the participants, awareness of essential drugs, and preparedness of the participants in handling of medical emergencies occurring in dental office [1].

Data were collected, statistical analysis for knowledge, attitude and practice was conducted, and the results were obtained using descriptive statistics and Chi square test using IBM SPSS version 22 software (Table 1) ($P \leq 0.05$).

Results

A total of 217 members participated in this study. Age range of participants was 21 to 30 years with a mean age of 23.9 years and a standard deviation of 2.418 years. Of all, 53.0% of the participants were females and 46.5% were males; 0.5% of the participants preferred not to disclose their gender. Out of the total participants, 149 (68.7%) were dental interns and 68 (31.3%) were postgraduates.

Of 217 participants, 110 (50.69%) had

Table 1. Comparison of various parameters for knowledge, attitude and practice of dental interns and postgraduates towards managing medical emergencies in dental chair using the Chi-square test

		Age	Gender	Qualification
What is the first drug of choice in anaphylaxis?	Chi-square	23.047	24.013	31.099
	df	3	6	3
	Sig.	0.000	0.001	0.000
When a patient has angina pain which of the drugs should be given?	Chi-square	4.171	5.289	6.699
	df	3	6	3
	Sig.	0.244	0.507	0.082
What is the correct BLS sequence?	Chi-square	1.279	4.513	0.290
	df	1	2	1
	Sig.	0.258	0.105	0.590
What is the location of chest compression?	Chi-square	5.920	3.889	9.855
	df	3	6	3
	Sig.	0.116	0.692	0.020
How many chest compression and breathing should be given in CPR in case of single rescuer?	Chi-square	3.432	6.488	3.055
	df	3	6	3
	Sig.	0.330	0.371	0.383
Do you think you can efficiently handle any emergency condition in your dental office very confidently?	Chi-square	2.912	4.923	1.964
	df	1	2	1
	Sig.	0.088	0.085	0.161
A patient suffered from syncope when you commenced a dental procedure. What would be your immediate action?	Chi-square	2.143	1.822	2.896
	df	3	6	3
	Sig.	0.543	0.935	0.408
A patient is cited with airway obstruction during dental treatment due to aspiration of foreign body, what would you do?	Chi-square	7.291	3.804	8.957
	df	3	6	3
	Sig.	0.063	0.703	0.030
If you confirm somebody is not responding to you even after shaking and shouting at him, what will be your immediate action?	Chi-square	1.919	5.659	4.682
	df	3	6	3
	Sig.	0.589	0.463	0.197
Which of the following is true in case of treating a patient with hemophilia?	Chi-square	2.460	3.110	1.825
	df	3	6	3
	Sig.	0.483	0.795	0.609
In a case of known diabetes, when the patient loses consciousness, what can be done?	Chi-square	1.024	1.350	0.675
	df	3	6	3
	Sig.	0.795	0.969	0.879
Do you enquire about medical history including medication intake and allergy?	Chi-square	0.205	18.940	0.083
	df	1	2	1
	Sig.	0.651	0.000	0.773b
Do you obtain vital signs (blood pressure, pulse rate, respiration rate and temperature) of patients before commencing any treatment?	Chi-square	3.278	12.473	1.576
	df	1	2	1
	Sig.	0.070	0.002	0.209
In a situation where after extraction there is spontaneous bleeding, what would be your primary management?	Chi-square	1.851	6.127	3.945
	df	3	6	3
	Sig.	0.604	0.409	0.267
What will be your primary management in case of epileptic fits in the dental chair?	Chi-square	5.831	18.190	3.428
	df	3	6	3
	Sig.	0.120	0.006	0.330
When a patient gets acute asthma attack during a dental procedure, how do you manage it?	Chi-square	3.506	1.861	2.047
	df	3	6	3
	Sig.	0.320	0.932	0.563
When a patient develops adrenal crisis during the treatment which drug should be administered?	Chi-square	3.792	0.965	0.944
	df	3	6	3
	Sig.	0.285	0.987	0.815

necessary emergency kits in their dental office among which, 58 participants were interns and 53 were postgraduates and 136 (62.67%) had access to all the emergency drugs among which 73 were interns and 63 were postgraduates.

About 40.37% of interns and 29.82 % of postgraduates had good knowledge about the drugs used for anaphylaxis. Statistically significant differences were present between postgraduates and interns regarding the choice

of drug for anaphylaxis (P<0.05); 91.2% of participants were certain about the drug of choice in managing angina among which 60.55% were interns and 30.37% were postgraduates.

About 71.4% of the participants had contemporary knowledge about the correct sequence to provide basic life support (BLS); among which, 50.00% were interns and 21.56% were postgraduates. Also, 85.3% of the participants (56.88% of interns and 28.44% of postgraduates) were sure about cardiopulmonary resuscitation (CPR) procedure. Only 52.1% of participants (55.96% of interns and 25.23% of postgraduates) were aware of the location of chest compression with statistically significant differences between postgraduates and interns.

Among all the emergency situations occurring in dental chair, about 87.0% of participants (46.79% of interns and 20.64% of postgraduates) had encountered patients with only syncope; 13.3% of participants (5.96% of undergraduates and 7.34% of postgraduates) had encountered both seizure and syncope; 2.29% of participants (1.83% of interns and 0.46% of postgraduates) had encountered syncope, seizure and bronchospasm of patients in dental chair; 2.75% of interns and 0.92% of postgraduates had encountered only seizure; 0.92% of interns and 0.00% of postgraduates had encountered both seizure and bronchospasm, and 4.13% of interns and 0.00% of postgraduates had encountered both syncope and bronchospasm. About 8.5% of participants (6.42% of interns and 1.83% of postgraduates) had not come across any medical emergency situation in their practice.

Also, 77.9% of participants were highly confident about handling any emergency condition in their dental office; among which, 113 (51.83%) were interns and 57 (26.15%) were postgraduates. Of all, 92.6% of participants (62.84% of interns and 29.82% of postgraduates) had knowledge about the management of syncope. About 52.5% of participants (61.93% of interns and 26.61% of postgraduates) were well accustomed to managing patients with airway obstruction. About 50.2% of participants (64.68% of interns and 28.44% of postgraduates) were expeditious in handling all medical emergencies in dental chair while 67.7% had a good knowledge about treating patients with haemophilia; among which 46.79% were interns and 29.10% were postgraduates. About 92.2% of participants (62.84% of interns and 29.36% of postgraduates) were confident about managing emergencies of diabetic patients; 94.9% of participants (65.14% of interns and 29.82% of postgraduates) enquired about medical history including medication intake and allergy. Also, 92.2% of participants (62.39% of interns and 29.82% of postgraduates) obtained vital signs of patients before commencing any treatment. Only 59% of participants (38.07% of interns and 20.64% of postgraduates) were aware of the primary management of spontaneous bleeding after extraction. About 88.9% of participants (59.63% of interns and 29.36% of postgraduates) were aware of the management of epilepsy in dental chair. About 68.2% were able to manage acute asthma attack during dental procedure, among which, 49.08% were interns and 19.27% were postgraduates. Also, only 62.7% of the participants (42.20% of interns and 20.64% of postgraduates) were cognizant in managing adrenal crisis during dental treatment.

Discussion

Avoidance and planning are frequently the finest cures for a crisis. To start with obtaining the patient's health history at first visit could be a great practice. The medical history ought to incorporate data with respect to the patient's past and present wellbeing status. It should moreover incorporate questions demonstrating issues that patient may not be mindful of, but may modify treatment [1,2,6].

There are very few studies conducted on dental interns and postgraduates based on clinical exposure, awareness and capability to handle emergency situations. In the present study, only 50.6% of the participants were working under good dental setup with availability of emergency kits and 62.7% of the population had access to all emergency drugs. Certain emergency drugs (Figure 1) and equipment that are essential in dental office are tabulated in Tables 2 and 3 [7-9].

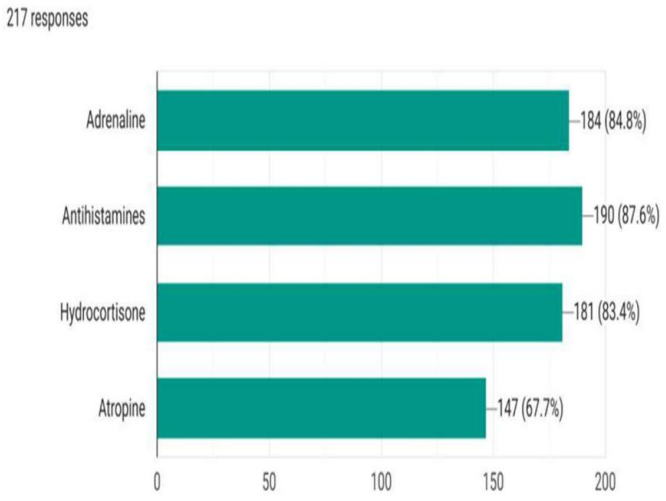

Figure 1. Availability of emergency drugs

In this study, 74% of dental interns and 83.0% of postgraduates had good knowledge on drugs used in anaphylaxis, angina pain, CPR procedures and BLS; 27.3% of undergraduates and 30.8% of postgraduates did not have thorough knowledge about the correct sequence of BLS (Figure 2) i.e. C-A-B; also, 45.3% of dental interns and 52.9% of postgraduates did not know the correct location of chest compression during CPR (Figure 3). Only 17.3% of undergraduates and 8.8% of postgraduates lacked the knowledge on correct procedure of CPR. This shows that participants lacked training in CPR. This finding is similar to the results of a study conducted by shenoy et al. [10], in which half of the respondents lacked knowledge and training in CPR.

Mostly, in dental institutions, the BLS and CPR training are provided as additional courses which are not compulsory in the curriculum. Thus, there are high chances for laxity to opt for these courses. Hence, for enhancement of competence in managing medical emergencies, regular standard BLS courses, more experience and training in CPR, and simulation of emergency scenarios must be incorporated in the curriculum. This should be outlined in a way it meets the needs of dental practitioners [11-17].

Successful patient management depends on understanding the pathophysiological processes and their rectification [11]. The most common medical emergency faced by the participants was syncope, and anaphylaxis was the second most common medical emergency [12-14]; 86% of interns and 91.1% of postgraduates had experienced syncope during their practice. Also, 6.42% of interns and 1.83% of postgraduates had not faced any medical emergency in their practice (Figure 4). Overall, the majority of interns and postgraduates had the confidence and capability in managing syncope but they did not have satisfactory knowledge and awareness about drugs used in management of anaphylaxis. Overall, 60.0% of dental interns and 52.0% of postgraduates conveyed that they were well aware of managing syncope, airway obstruction, epilepsy, and diabetic patients.

When it comes to practice, the participants are unable to choose the appropriate option for effective primary management of certain medical emergencies. In this study, only 30.6% of dental interns and 36.7% of postgraduates

Table 2. Commonly used drugs for emergency situations in dentistry

Emergency condition	Drugs required
Anaphylaxis	Adrenaline (epinephrine) injection 1:1000, 1 mg/mL
Hypoglycaemia	Oral glucose solution/tablets/gel/powder (e.g. GlucoGel', formerly known as Hypostop' gel [40% dextrose]) Glucagon injection 1 mg (e.g. GlucaGenHypoKit) (Ii2 agonist)
Acute exacerbation of asthma	Salbutamol aerosol inhaler 100 mcg/ activation
Status epilepticus	Buccal or intranasal midazolam 10 mg/mL
Angina	Glyceryl tri-nitrate spray 400 mcg/metered activation
Myocardial infarction	Dispersible aspirin 300 mg

Table 3. Equipment necessary for emergency situations in dentistry

Equipment	Description
Oxygen (02) delivery	Portable apparatus for administering oxygen, Oxygen face mask (non-rebreathe type) with tube Basic set of oropharyngeal airways (sizes 1, 2, 3 and 4) Pocket mask with oxygen port Self-inflating bag valve mask (BVM; 1-L size bag).
Portable suction	Portable suction with appropriate suction catheters and tubing (e.g. Yankauer sucker)
Automated external defibrillator (AED)	All clinical areas should have immediate access to an AED (collapse-to-shock time <3 min)
Automated blood glucose measuring device	Capillary blood glucometer
Equipment for administering drugs intramuscularly	Single-use sterile syringes (2-mL and 10-mL sizes) and needles (19 and 21 sizes)

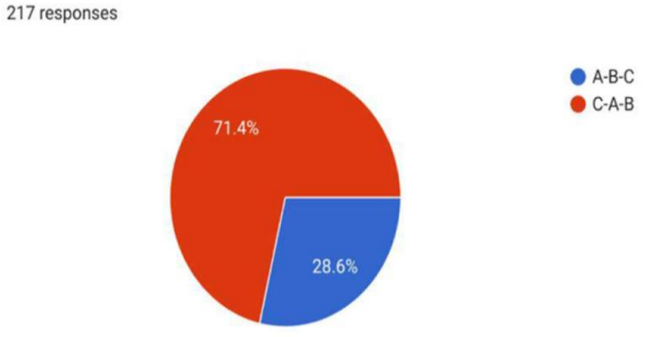

Figure 2. Correct sequence of BLS

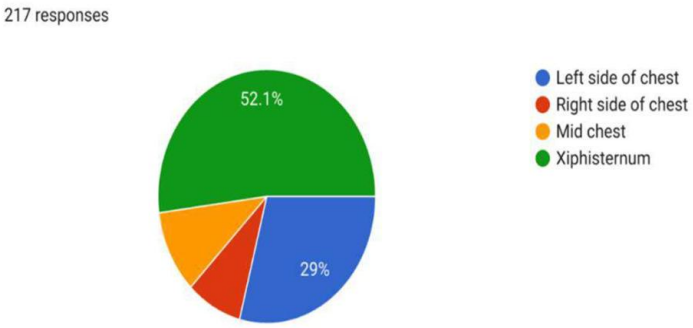

Figure 3. Location of chest compression

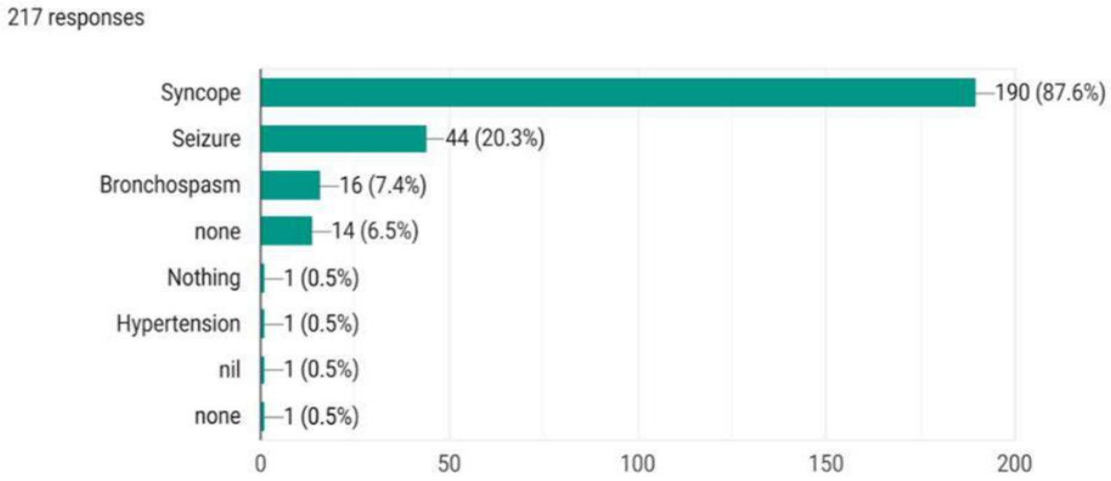

Figure 4. Emergency situations faced in the dental chair

were primarily able to manage spontaneous bleeding, epileptic attacks, acute asthma attack, and adrenal crisis on dental chair. The confidence in utilization of drugs in any medical emergency is really lower than the knowledge about all the drugs mentioned. This recommends that in spite of the fact that participants received training on medical emergencies in theoretical basis, participants were not especially confident in treating medical emergencies, and may require further practical training [3,11,17,18].

Conclusion

The results of this study affirmed that comparatively dental interns lacked the capability to efficiently oversee medical emergencies. This depicts the necessity of in-depth knowledge and implementation for practice in medical emergencies.

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