

## ORIGINAL RESEARCH

# Availability of Emergency Drugs and Equipment in General and Specialist Dental Settings in Babol, Iran

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## ABSTRACT

**Aim:** Medical emergencies can frequently happen in dental settings and it is critical to outfit the clinic by emergency drugs and equipment. The aim of this study was to evaluate the emergency drugs and equipment in general and specialist dental settings in Babol, Iran.

**Materials and methods:** A questionnaire containing closed ended questions about the available emergency drugs and equipment was used in this descriptive-analytical study. Data were subjected to descriptive analysis using SPSS 18.0 to identify the most frequent drugs and equipment. Chi-square and t-test were used to evaluate the correlation between the variables.  $p < 0.05$  was considered statistically significant.

**Results:** One hundred and twelve dentists answered the questionnaire. The most available drug and equipment were epinephrine (67%) and single use syringe (81.3%) respectively. Significant correlation was found between degree of education and availability of first group of emergency drugs and between sex and possession of second group of emergency equipment ( $p < 0.05$ ).

**Conclusion:** Degree of availability of emergency drugs and equipment was moderate to low and training about emergencies should be included in the didactic topics of universities and workshops.

**Clinical significance:** Information about emergency drug and equipment would help to manage the unwanted emergency situations.

**Keywords:** Emergency, Drug, Equipment, Questionnaire.

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**Conflict of interest:** None declared

## INTRODUCTION

Medical emergencies can frequently happen in dental settings and inability to cope with them can lead to tragic outcomes.<sup>1</sup> There are some factors that can increase the risk of medical emergencies in dental settings including increased longevity of population that led the people having medical conditions which predispose them to medical emergencies, increased propensity to prescribe medication in dentistry and scientific improvements in dentistry for treating medically compromised patients. On the other hand, some factors can decrease the risk of medical emergencies such as thorough evaluation of patient's medical history, physical examination and preparedness for possible changes in treatment plan in the case of emergency.<sup>2-4</sup> Every dental setup should be prepared to handle all expected medical emergencies effectively. Such preparedness would include knowledge and science of the clinician, training of clinical staff and availability of emergency drugs and equipment in the dental clinics.<sup>5</sup> Malamed has categorized emergency drugs into four groups and equipment into two sets: critical, noncritical, advanced cardiac life support and antidotal drugs; and critical and noncritical equipment.<sup>2</sup> According to a study performed by Chapman et al in Australia, the most available drugs in dental settings were oxygen and adrenaline; and the most available equipment was manual resuscitators.<sup>6</sup> In a study performed by Atherton et al in Britain, 90% of the dentists had airway aspirator, oxygen and injectable steroid in their emergency set.<sup>7</sup> As the rules of medical councils differ from each society to the other, the aim of this study was to evaluate the emergency drugs and equipment in general and specialist dental settings in Babol, Iran.

## MATERIALS AND METHODS

A questionnaire approach was chosen for this descriptive-analytical study. Based on an inquiry from Babol Medical Council, a list of active general and specialist dental settings was prepared. After explanation about the aim of the study, the dentists filled the anonymous questionnaire (Table 1). Needed characteristics of each dentist were age, sex, year of graduation, duration of occupation and education degree. Also, the questionnaire contained closed ended questions about the available emergency

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**Table 1:** A sample of the questionnaire

**In the name of God**  
Questionnaire  
Evaluation and drugs and equipment in general and specialist dental settings in Babol

Age: Sex Male  Female

Degree of education: General  Specialist

Year of graduation: Duration of Occupation:

Please mark x if you have any of the mentioned drugs or equipment in your clinic:

**First group of emergency drugs**

Epinephrine  Chlorpheniramine/Diphenhydramine  Oxygen  Nitroglycerin

Albuterol/Salbutamol  Aspirin  Anti-hypoglycemia (Sugar)

**Second group of emergency drugs**

Midazolam/Diazepam  Morphine/Meperidine  Metoxamine/phenylephrine

Hydrocortisone  Anti-hypoglycemia (Dextrose 50%)  Anti-hypertension (Esmolol/Propranolol)

Atropine  Aromatic Ammonia  Nifedipine

**Third group of emergency drugs**

Lidocaine  Dopamine  Morphine sulphate  Verapamil

**Fourth group of emergency drugs**

Naloxane  Flumazenil  Physolstigmine  Procaine

**First group of emergency equipment**

Oxygen capsule  Oxygen face mask  Ambu bag  Single use syringe

Portable suction  Tourniquet  Magil forceps

**Second group of emergency equipment**

Cricothyrotomy scalpel  Cricothyrotomy needle  Oropharyngeal airway

Laryngoscope  Endotracheal tube

Thanks for your cooperation

drugs and equipment. Completed questionnaires were collected and data were subjected to descriptive analysis using SPSS 18.0 to identify the most frequent drugs and equipment. Chi-square and t-test were used to evaluate the correlation between the variables.  $p < 0.05$  was considered statistically significant.

**RESULTS**

One hundred and twelve (84%) out of 132 dentists had filled the questionnaire of which 79 (70.5%) were males and 33 (29.5%) were females; and 92 (82%) were general dentists and 20 (18%) were specialists. The age range of respondents was 26 to 81 years (mean  $41.04 \pm 8.45$  years) with the mean age of 28.96 for females and 36.43 for males; the difference was statistically significant ( $p < 0.05$ ) duration of occupation was in the range of 2 to 56 years (mean  $13.85 \pm 8.19$  years). Availability of the first group of emergency drugs was more than the others. Overall, 50.2% of the dentists had the first group

of emergency drugs in their clinic with epinephrine being the most (67%) and bronchodilators such as albuterol and salbutamol being the least (33%). Overall percent of availability of the second group of emergency drugs was 25.6 with hydrocortisone being the most (47.3%) and aromatic ammoniac being the least (11.6%). Among the third group of emergency drugs, the most and the least available drugs were lidocaine and verapamil, respectively and the overall availability was 6.25%. The only available drug of fourth group of emergency drugs was procaine which existed in just two dental settings (1.7%).

Regarding the emergency equipment, 51.1% of the dentists had the first group of emergency equipment in their clinic with the single use syringe being the most (81.3%) and the magill forceps being the least (10.7%). Overall availability of second group of emergency equipment was 11.2%. Cricothyrotomy scalpel was the most available equipment (15.1%) and the least was cricothyrotomy needle (7.1%).



**Table 2:** Availability of emergency drugs and equipment in dental settings; comparison of sex, duration of occupation and degree of education

		Sex		Degree of education		Duration of occupation	
		Male (%)	Female (%)	General (%)	Specialist (%)	<10 years (%)	>10 years (%)
Drugs	Group 1	55	55	59.5	36.6	53.7	54.2
	Group 2	24.5	29.3	30	18.9	27	25
	Group 3	6.3	6	6.5	5	4.2	6.3
	Group 4	6.3	6	5.4	5	4.2	5.8
Equipment	Group 1	41.1	43.8	43	41	38.9	44.7
	Group 2	5.5	13.7	10.8	13	13.6	10.4

Table 2 shows the detailed availability of emergency drugs and equipment in the study population. Availability of the first group of emergency drug was significantly more in general dental clinics ( $p < 0.05$ ) but sex and duration of occupation did not show significant correlation ( $p > 0.05$ ). Availability of the other groups of emergency drugs was not significantly correlated to sex, degree of education and duration of occupation ( $p > 0.05$ ).

Regarding the availability of emergency equipment, the only significant correlation was found between sex and second group of emergency equipment which existed more in female dentists dental settings ( $p < 0.05$ ).

## DISCUSSION

In this descriptive-analytical study, 112 out of 132 dentists whose name were recorded in Babol Medical Council had filled a questionnaire with closed ended questions about available emergency drugs and equipment in their dental setting. Reasons of non-cooperation of 21 dentists were limitation in time, unwillingness and absence because of travelling.

Oxygen capsule was available in 65.7% of dental settings. Similar studies performed by Malamed et al and Atherton et al showed 95.4 and 70% respectively.<sup>7,8</sup> A probable reason for this difference can be stricter laws and supervision regarding emergency drugs and equipment in European and American countries therefore the dentists try to outfit their clinics to prevent legal problems to happen. In fact, oxygen administration is recommended for almost all medical emergencies except during hyperventilation.<sup>9</sup> All dental professionals must be able to correctly administer oxygen, at therapeutic levels, during in-office emergencies.

In current study, the most available drug in dental settings was epinephrine. Although the obtained percent of availability is lower than the studies performed by Chapman and Altherton et al<sup>6,7</sup> but it shows a great improvement compared to earlier studies in Iran. Over time, because of updates in information, necessity outfitting the clinic emergency drugs has been better understood.<sup>10-12</sup>

Availability of second group of emergency drugs such as salbutamol and hydrocortisone was somehow similar to the first group; that indicates the need for more awareness of emergency drugs among dentists.

Although there was not any significant difference between men and women in availability of the first group of emergency drugs, women showed some superiority in having the second group in their dental setting. It seems that medical emergencies are of more importance to women. Also, may be because of lower mean age of women, less time has been passed from the time of graduation and the importance of medical emergencies is still remembered.

Although, it is considered that experienced dentists must pay more attention to medical emergencies, because of more confrontation, no correlation was found in our study. Probably, because of more skill and experiment, older dentists consider that they can gain their patients trust and are capable to cope with any sudden incident.

## CONCLUSION

Degree of availability of emergency drugs and equipment was moderate to low and training about emergencies should be included in the didactic topics of universities and workshops. More concise supervision on the emergency drugs and equipment in dental settings should be considered by responsible organizations.

## CLINICAL SIGNIFICANCE

Information about emergency drug and equipment would help to manage the unwanted emergency situations.

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