THE NEW ARMENIAN MEDICAL JOURNAL
Vol.14 (2020), No 1, p.12-18

PREPAREDNESS OF DENTAL CLINICS FOR MEDICAL EMERGENCIES IN THE MIDDLE REGION OF SYRIA (A CROSS-SECTIONAL STUDY)

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Received 30.07.2019; accepted for printing 03.12.2019

Abstract

Sudden and unexpected medical conditions pose an immediate risk to a person's life or health.

Preparedness and ability to deal with medical emergencies in dentistry requires adequate equipment and appropriate drugs as well as sufficient scientific background.

This cross-sectional study was conducted to evaluate the readiness and assets of emergency drugs in the clinics in the middle region in Syria. It was conducted using a self-administered questionnaire by the physician to determine the physician's specialty, the age of the clinic, its readiness and the emergency cases. Results were collected according to the SPSS method, the way ANOVA test and the significance level is equal to (p=0.6).

We found that specialist dental clinics in the middle region were better equipped than general dental clinics for emergency cases (p=0.5).

The most common equipment pieces in the clinics are the sphygmomanometers, serums and the sugar screening devices. However, the least common equipment is the Ambu bags, airway and intravenous catheters, and there are no intubation tubes. The older the clinic, the better its preparedness for emergency cases p = 0.03. The most common cases are loss of consciousness, hypotension and hypoglycemia. Yet, the least common cases were myocardial infarction, cardiac arrhythmia and angina pectoris. Self-assessment of the mid-area clinics was medium and good respectively.

Conducting a study covering the Syrian Arab Republic and raise the readiness of doctors and clinics for the reception of emergency cases.

Keywords: *readiness, clinics, emergency cases, loss of consciousness, hypoglycemia.*

Introduction

Medical emergencies refer to sudden and unexpected medical conditions that pose an immediate risk to a person's life or health in the long term if immediate action is not taken [*Lexington Medical Center, 2017*]. Medical emergencies in dentistry are unavoidable and one of the most complex cases that only a professional dentist can handle.

Because of the importance of saving lives and maintaining, the health of patients from diseases and emergencies in all medical treatments as well as dental treatment, if dentists lack sufficient knowledge and do not know how to deal with these cases, the life of the patient will be threatened [*Malamed S, 2014*].

Preparedness and ability to deal with medical emergencies in dentistry requires adequate equipment and appropriate drugs as well as adequate scientific background [*Azim Rashti S, Zarabadipour M, 2014*]. On a daily basis, many people, either young or old, in different countries around the world undergo dental treatment. There are patients who suffer from different systemic diseases [*Hashemipour M et al., 2009*]. Each dentist should expect to have a case that needs emergency diagnosis or managing in the course of his/her practice [*Rosenberg M, 2010*].

The most common cases in the dental clinics are caused by cardiovascular diseases, respiratory

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diseases, metabolic diseases and drug interactions caused by topical drugs used in dentistry [*Rosenberg M, 2010*]. The Dental Treatment Council of the American Dental Association published a report in 2002 that indicated that all dental clinics should be supplied with at least the basic emergency drugs and equipment. The published rules and guidelines regarding drugs and emergency equipment that should be available in the dental clinic differ, but by making a little comparison among them we reach a summary that can be adopted [*American Dental Association, 2002; Haas D, 2002; Rosenberg M, 2010; A Statement from The Resuscitation Council (UK), 2012*].

Malamed S. (2000) states that the equipment pieces used in emergency cases are a combination of drugs (epinephrine, diphenhydramine, oxygen, nitroglycerin, diazepam, etc.) and equipment (pipettes, intubation tubes, venous catheters, air cannulas, oxygen, etc.) and that they are necessary in dealing with life-threatening situations [*Saef S, 1995*]. The results of various studies around the world have shown that emergency drugs and equipment should be available in dental clinics [*Fast T et al., 1986; Lipp M et al., 1992*].

The study aimed to evaluate the readiness and assets of emergency drugs in the clinics in the middle region in Syria.

Literature Review

Back to the medical literature, we have found many studies and research on the preparedness of dental clinics and dentists for emergency cases.

In a study by Girdler N and Smith D of 887 British dentists, the most common emergency events reported by dentists each year were the following: Vasovagal syncope (1.9%), Hypoglycemia (0.17%), Angina pectoris (0.17%), Choking (obstruction of the airway) (0.09%), Epilepsy (0.17%), Asthma (0.6%), Hypersensitivity (0.013%), Hypertension episodes (0.023%), Myocardial infarction (0.3%), Cardiac arrest (0.2%).

While nearly half of the dentists around the world are unable to perform CPR correctly [*Chapman P, 1997; Girdler N, Smith D,1999; Shampaine GS,* 1999; *Gonzaga H et al., 2003*] studies and statistics show that (1.1-4.1%) of the emergencies that occurred in dental clinics include cardiopulmonary resuscitation [*Girdler N, Smith D, 1999*].

In a study conducted in Damascus to evaluate the preparedness of dental clinics in 2012, nitroglycerin, aspirin, adrenaline, sphygmomanometer, stethoscope, syringes, dental surgical suction tools were the most common drugs and equipment in the participating physicians' clinics. 65% of them inspected their validity and effectiveness periodically [*Samer K, Yasser M, 2012*]. The current readiness of the current study clinics was low 61.2%, while only 4% were excellent. 92% of the participants agreed on the need for an emergency kit in the dental clinic.

In 2016, a study was conducted in Yasuj, Islamic Republic of Iran, to determine the readiness of dentists and the readiness of their clinics for emergency cases. Epinephrine, oxygen, nitroglycerin, suction tools, surgical scalpel and glucose were the most common equipment pieces and drugs used in the clinics. The percentage of physicians who worked in their clinics for more than 20 years was 8.6 percent [*Habib Allah Shojaeipour et al., 2017*].

The percentage of doctors working between 1997 and 2001 for more than 15 years (4%), who have worked for more than ten years (7%), for more than five years (2.9%). The study also showed that half of the doctors involved in the research did not participate or were not trained in special courses on emergency cases. More than 75% of dentists learned to manage emergency cases in the university only, while 90% of them found that they needed to update their information about emergency cases and how to manage them. Nearly half of the participants faced at least one emergency case throughout the year [*Habib Allah Shojaeipour et al., 2017*].

In 2015, a study carried out in Saudi Arabia showed that nearly 67% of dentists participating in the study faced emergency cases over three years. Only 45% were able to perform CPR (Cardiopulmonary Resuscitation) and less than a third of the clinics were equipped with basic equipment and drugs [*Alhamad M et al., 2015*]. Atherton G. and co-authors (1999a) found that 20% of physicians evaluated the preparedness of their clinics as good or excellent.

In a study of Morse Z. and Murthi V (2014) 9.1% of physicians rated their clinics as excellent, and none of them rated their preparedness as poor.

The theoretical review urged us to evaluate the dental clinics in the middle region in terms of preparedness for emergency cases, the expertise of the practitioners and the equipment and drugs found in these clinics.

MATERIALS AND METHODS

A cross-sectional study was conducted using a self-administered questionnaire by the physician. Closed questions were used in which the answer was checking an empty box with a right or wrong sign of the equipment and the type of emergency cases that occurred in the clinic, as well as questions with short answers such as the name of the doctor (this was optional), the specialty, the space of the clinic, the age of the clinic, the number of dental chairs, the number of dentists working and their specialization, the number of emergency cases per month or year, the physician's need for assistance from outside the clinic and the answer was "yes or no". At the end of the questionnaire, we asked each dentist to evaluate his/her clinic out of 100 in terms of preparedness for emergency cases.

The age of dental clinics in the study was as follows: 0-10 years (42%), 11-20 years (28%), 21-30 years (26%), 31 and more years (4%).

Having explain everything about the questionnaire, information was collected in dental clinics personally in the middle region of Syria in February and March of 2019. The purpose and consent of the dentists were submitted so that the questionnaire was filled without reference or scientific books and without consulting any colleagues. The confidentiality of information was emphasized. 50 copies of the questionnaire were collected from the dentists randomly, including male and female doctors of different ages, with or without specialization (Table 1).

TABLE 1.

Preparedness of dental clinics for medical emergencies in Syria midlands

		Date of filling	dd.mm.yy.
Doctor's Name:			
Clinic space:			
Their specialties:			
The clinic Equipment		Number of emergency cases per month:	
Oxygen Cylinder		Type of emergency cases	
*Oxygen Couplings and Masks		*Epileptic episode	
*Ambu device		*loss of consciousness	
*Adrenaline		*Myocardial infarction	
*Dextrose solution		*Angina pectoris	
*Saline solution		*Hypoglycemia	
*Venous catheter		*Hyperglycemia	
*Aromatic ammonia		*Hypertension	
*The chair is equipped with an emergency button		*Hypotension	
*sphygmomanometer		*Hyperventilation	
*Oximeter		*Asthma attack	
*Sugar screening device		*Hypersensitivity	
*Analgesics		Did you need help from outside the clinic?	Yes
*Antispasmodic			No
*Bronchodilators		How do you evaluate your dental clinic?	Very good
*Nitroglycerin			good
* Intubation tubes			middle
*Airway tube			bad
Other questions			very bad
		Are you prepared for all dental emergencies in your opinion?	I do't know
			Well prepared
			Not Prepared

The reliability of the results acquired by this questionnaire was based on SPSS version 25 using the ANOVA Way test.

Results and Discussion

The questions list above were filled by 50 dentists, 31 (62%) of them were general dentists and 19 (38%) were specialist dentists.

We found that many of the essential drugs and emergency equipment recommended in dental clinics were not present in dental clinics in the middle area of Syria. Findings of this study coincided with earlier studies [*Chapman P, 1997; Atherton G et al., 1999b; Haas D, 2006; Mesgarzadeh A, Dabbaghi T, 2006; Muller M et al., 2008; Adewole R et al., 2009; Bhavana B et al., 2009; Rosenberg M, 2010; Samer K, Yasser M, 2012*]. But specialist medical clinics were more ready (Table 2).

This difference between the preparedness of dental clinics of general physicians compared with the specialized dentists was statistically significant differences (p=0.5), which is less than the statistically significant (p=0.6). Most commonly were found analgesics (50%) followed by saline solution, antispasmodic, adrenaline, dextrose solution, nitroglycerin, bronchodilators, oxygen. Our results have not been consistent with other studies such as [*Chapman P, 1997; Morse Z, Murthi V, 2004; Samer K, Yasser M, 2012*] where nitroglycerin, aspirin and adrenaline were the most common drugs available.

Table 2

Ranking of drugs in the sample clinics

	General		Specialists	
	n	%	n	%
Links and oxygen masks	4	0.08	3	0.06
Ambu device	1	0.02		
Adrenaline	12	0.24	15	0.30
Dextrose solution	14	0.28	12	0.24
Saline Solution	16	0.32	15	0.30
Venous catheter	4	0.08	1	0.02
ammonia	1	0.02	1	0.02
The chair is equipped with an emergency button	7	0.14	13	0.26
sphygmomanometer	13	0.26	15	0.30
Oximeter	3	0.06	2	0.04
Sugar Screening Device	5	0.10	11	0.23
Analgesics	13	0.26	25	0.50
Antispasmodics	11	0.23	18	0.36
Bronchodilators	6	0.12	12	0.24
Nitroglycerin	6	0.12	15	0.30
Intubation tubes				
Airway	1	0.02		
Oxygen cylinder	4	0.08	3	0.06

In the middle area clinics, the oxygen cylinder was the least of the emergency equipment found with a 14% presence, although it is the most important according to Studies [*McCarthy F, 1993; Chapman P, 1997; Bhavana B et al., 2009; Amirchaghmaghi M et al., 2011; Samer K, Yasser M, 2012*].

This result is inconsistent with the results of several studies where oxygen was the most common asset [*Chapman P, 1997; Atherton G et al., 2000; Mesgarzadeh A, Dabbaghi T, 2006; Bhavana B et al., 2009; Amirchaghmaghi M et al., 2011*].

In other results, oxygen, adrenaline and injectable cortisone were more common [*Atherton G et al., 1999b*].

The most common emergency equipment in the central region is the sphygmomanometer and the stethoscope. It is similar to the study of [*Rosenberg M, 2010; Samer K, Yaseer M, 2012*].

As for the readiness of the chair to receive emergency cases with the presence of an emergency button, we found that 40% of the chairs were equipped with an emergency button. We also found that sugar screening devices 32% and Oxygen masks were only available in 14% of the clinics. The findings are consistent with [*Chapman P, 1997; Amirchaghmaghi M et al., 2010a*]. The incidence of intravenous catheter and oximeter was only 10%, 4% ampo mask, 2% air cannula. These low results were not consistent with [*Atherton G et al., 1999a*]. Intubation tubes and its equipment unfortunately were not available in any of the clinics participating in this study. In terms of emergency doctors have shared the number of possible medical emergencies in their clinics (Table 3).

We found that loss of consciousness, hypotension, hypoglycemia and hypertension were the most common cases in the dental clinic [*Samer K, Yasser M, 2012*]. In terms of loss of consciousness, hypotension and hypoglycemia. The rate of epileptic seizure 24%, which is not compatible with other studies where the epileptic seizure rate was 18.8% [*Samer K, Yasser M, 2012*]. The rest of the emergency cases were sequentially hypersensitivity to-

TABLE 3

The number of possible emergency cases.

	General Dentists		Specialist Dentists	
	n	%	n	%
Epileptic seizure	7	0.14	5	0.10
Loss of consciousness	24	0.48	7	0.14
Myocardial infarction			1	0.02
Angina pectoris	2	0.04	1	0.02
Hypoglycemia	19	0.38	7	0.147
Hyperglycemia	11	0.23	4	0.08
Hypertension	19	0.38	4	0.08
Hypotension	23	0.46	6	0.12
Hyperventilation	5	0.10	1	0.02
Asthma attack	4	0.08	1	0.02
Hypersensitivity	5	0.10	2	0.04
Arrhythmia			1	

wards drugs 14%, cases of hyperventilation 12%, asthma attacks 10%, angina pectoris 6%. Myocardial infarction was very low (2%) and arrhythmia was also (2%) which are very low percentages, unlike the rest of the studies where the ratios were high [*Samer K, Yasser M, 2012*].

Table 3 shows that general dentists' cases are more frequent than those of specialist ones (p=0.19), which is statistically significant where (p=6). We believe that this is due to the experience of the specialist in preparing the patient before the dental work and this reduces the danger of an emergency case occurrence. We noticed that the older the clinic, the greater the readiness for emergency cases, which is a statistically significant result (p=0.03), which is lower than our statistical mean where p=0.6. The percentage of doctors who needed extra-clinic assistance was 22%.

We found that 14% of the clinics were weak, 50% of the clinics were medium, 30% of the clinics were good, and 6% of the clinics were excellent. Other studies evaluated the most in terms of readiness weak and the least excellent 17, 24, 30, 34, 35, 36 [*Clark M et al., 2006; Carvalho R et al., 2008; Adewole R et al., 2009; Amirchaghmaghi M et al., 2010b; Amirchaghmaghi M et al., 2011; Samer K, Yasser M, 2012*]. In our study the most were mediocre and the least excellent.

The majority of physicians in the current study evaluated the readiness of their clinics from medium to good and thus agreed with the study of Atherton and his colleagues (*1999b*). They found that 20% assessed the readiness of their clinics weak or medium, while 78.7% assessed the readiness of their clinics from good to excellent [*Morse Z, Murthi V, 2004*]. While 9.1% of physicians rated their clinics as excellent, and none of them rated their readiness as weak [*Bhavana B et al., 2009; Samer K, Yasser M, 2012*].

CONCLUSION

Dental specialists' clinics in the middle area of Syria are better equipped than general dentists' clinics in terms of emergency cases.

- The most common equipment pieces in the clinics are the sphygmomanometer, serums and the sugar screening devices. However, the least common equipment is the Ambu device, airway and intravenous catheter.
- There were absolutely no intubation tubes in the clinics of the middle area of Syria
- The older the clinic, the better its preparedness for emergency cases.
- The most common cases are loss of consciousness, hypotension and hypoglycemia. Yet, the least common cases were myocardial infarction, cardiac arrhythmia and angina.
- Self-assessment of the mid-area clinics was medium and good respectively.

RECOMMENDATIONS

- Conducting a comprehensive study of the Syrian Arab Republic for the preparedness of dental clinics for emergency cases.
- Holding training courses on first aid for dentists periodically.
- Checking clinics periodically by the syndicate or the Ministry of Health to examine their preparedness for emergency cases.
- Adding a course on first aid to the curricula of dental faculties.

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