

## Research Article

### **Dentists' Awareness about Management of Medical Emergencies in Dental Offices Birjand-2014**

Narjes Akbari<sup>1</sup>, Vajehallah Raeesi<sup>2</sup>, Sediqe Ebrahimipour<sup>3\*</sup>, Khaironnesa Ramezanzadeh<sup>4</sup>

<sup>1</sup>Assistant Professor, Dept. of Oral Medicine, School of Dentistry and Dental Research Center of Birjand University of Medical Sciences, Birjand, Iran.

<sup>2</sup>Assistant Professor, Department of Internal Medicine, Birjand University of Medical Sciences, Birjand, Iran.

<sup>3</sup>Assistant Professor, Dept. of Endodontics, School of Dentistry and Dental Research Center, Birjand University of Medical Sciences, Birjand, Iran.

<sup>4</sup>Master of Curriculum, EDC Expert, Birjand University of Medical Sciences, Medical of Education Research Center, Birjand, Iran.

#### **\*Corresponding author**

Sediqe Ebrahimipour

Email: [sdent22@bums.ac.ir](mailto:sdent22@bums.ac.ir)

---

**Abstract:** Most of medical emergencies which take place in dental offices could be life-threatening. In this regard, the knowledge about these medical emergencies is of great importance and all of the dental staff should have sufficient knowledge in diagnosing and the way to manage them. This study aims to evaluate knowledge of Birjand dentists in diagnosis and treatment of medical emergencies. A questionnaire was designed and its reliability and validity was standardized. The recorded data were analyzed using descriptive analysis, Pearson correlation coefficient, one-way ANOVA and Mann-Whitney through SPSS 16 software. From eighty six (86) dentists who answered the questionnaire, 74(86%) were general dentists and 12(14%) were dental specialists, 52(60.4 %) were male and 34(39.6%) were female. The mean age and work experiences in male dentists was significantly more than female ( $P<0.05$ ), but there is no significant differences in terms of mean patient visits per day, hours of work per day and knowledge scores between male and female. The level of awareness of 39.5% of dentists was good, in 37.2% was average and in 23.3% was poor. The knowledge of dentists about diagnosis and management of dental emergencies was not satisfying. More attention should be paid during postgraduate and general courses. In addition, holding theoretical and practical educational courses about approaches to manage medical emergencies results enhances the knowledge of dentists.

**Keywords:** dentists, emergencies, Knowledge.

---

#### **INTRODUCTION**

Nowadays a large number of population from young to elderly are subjected to dental treatment. As the quality of health care is improving and life expectancy is increasing, dentists are required to treat a growing number of elderly and medically compromised patients. Studies have shown that half of all patients treated in dental school have at least one chronic disease or condition. Since some diseases and their treatments increase the likelihood of a medical emergency during dental care, dentists must be prepared to manage a variety of medical emergencies [1], such situations are more likely to occur within the confines of the dental office due to the increased level of stress which is so often present [2]. For example, fear and anxiety may make these patients prone to medical emergencies such as syncope and Hyperventilation syndrom [2].

The total prevalence of all emergency events (excluding syncope) was 0.7 cases per dentist per year

[3]. Effective management of an emergency situation in the dental office is ultimately the dentist's responsibility [4]. The lack of training and inability to cope with medical emergencies can lead to tragic consequences and sometimes legal action [5-6].

Every patient expects His/her dentist to be familiar with emergency interventions which include basic life support, advanced life support and specific drugs to be administered in emergencies [6].

There is a significant need for increased awareness among dental professionals about emergency medicine. Every dental professional should be trained in emergencies which maybe lifethreatening and should be able to deal with anywhere and any situation. Dental professionals should be aware of protocols for initial stabilization of the patient in the dental office. Emergency can occur in any dental office without any warnings. There is an Increased number of medicolegal

cases due to rise in the number of deaths in the dental chair [7].

The best way to handle an emergency is to be prepared in advance. Dentists, being members of the healthcare profession, should be prepared to deal with medical emergencies which may arise at their workplace [8].

Many studies have been conducted about the types and prevalence of medical emergencies occurring in dental offices, as well as about the preparedness and experience of dentists in tackle life-threatening emergencies, in various countries [2, 7-16].

Till now there is no information about the level of awareness of Birjand dental practitioners in management of medical emergencies at dental offices, therefore the purpose of this study was to determine the level of knowledge and preparedness of dentists to diagnose and manage medical emergencies at their dental offices in Birjand.

**MATERIALS AND METHODS**

In this descriptive, cross-sectional study all general dentists and dental specialists who were working in South Khorasan Province (100 people) and taking part in continuous education program in faculty of dentistry of Birjand University of medical sciences were participated.

Data were collected using a standard questionnaire in which the validity of the questionnaire

was confirmed using content validity method. Two oral medicine experts evaluated the questionnaire and test retest was performed to confirm the reliability (r=0.83)

The questionnaire comprises two sections: 1) demographic data include age, gender, academic rank, work experience, number of patient per day and number of working hours per day 2) eleven questions that assessed knowledge of diagnostic skills and awareness about management of medical emergencies in dental offices (each correct answer were awarded 1 and wrong answer were given a zero score). Accordingly, the score 9-11 was excellent, 7 -8 was good 5 -6 was average and 1-4 was determined as weak.

From 100 distributed questionnaires 86 questionnaires were returned (response rate 86%). Verbal consent was obtained from each participant. Collected data were analyzed using descriptive statistics (mean, standard deviation, percent and median) and Pearson correlation test, analysis of variance at 0.05 of confidence by SPSS16.

**RESULTS**

Total of 86 dentists participated in this study. 74 (86%) were general dentists and 12 (14%) were dental specialists. the respondents were all within the age range of 25-48 years with the mean (standard deviation) for age of 36.6 (7.46) years. Other demographic characteristic of the respondents are shown in table-1.

**Table-1: demographic characteristics of the respondents**

| Variable                 | N (%)     |
|--------------------------|-----------|
| education                |           |
| general                  | 74 (86)   |
| specialists              | 12 (14)   |
| Gender                   |           |
| Male                     | 52 (60.4) |
| Female                   | 34 (39.6) |
| Age                      |           |
| ≤35                      | 42 (48.8) |
| >35                      | 44 (51.2) |
| Work experience (year)   |           |
| ≤ 10                     | 46 (53.5) |
| > 10                     | 40 (46.5) |
| Work hours per day       |           |
| 6                        | 50 (58.1) |
| > 6                      | 36 (41.9) |
| Number of visits per day |           |
| ≤ 5                      | 28 (32.6) |
| 6-10                     | 44 (51.2) |
| >10                      | 14 (16.3) |

The average of age and work experience of the male dentists were significantly higher than female dentists ( $p < 0.05$ ), But there was no significant difference between male and female dentists in terms of

the average number of patient per day, the number of working hours per day, and the knowledge scores ( $p > 0.05$ ) (Table-2).

**Table -2: Comparison of demographic characteristics of the male and female dentists**

| Gender<br>Variable           | male             |        | female           |        | total            |        | P value |
|------------------------------|------------------|--------|------------------|--------|------------------|--------|---------|
|                              | Mean $\pm$ SD    | domain | Mean $\pm$ SD    | domain | Mean $\pm$ SD    | domain |         |
| Age                          | 40.23 $\pm$ 6.48 | 25-48  | 31.06 $\pm$ 5.14 | 25-44  | 36.60 $\pm$ 7.46 | 25-48  | 0.001*  |
| Experience                   | 14.35 $\pm$ 7.61 | 1-25   | 7.29 $\pm$ 5.51  | 1-16   | 11.56 $\pm$ 7.63 | 1-25   | 0.002** |
| Number of visits per day     | 9.77 $\pm$ 8.03  | 4-40   | 9.59 $\pm$ 7.94  | 3-30   | 9.70 $\pm$ 7.90  | 3-40   | 0.94    |
| Number of work hours per day | 6.69 $\pm$ 2.31  | 1-11   | 5.82 $\pm$ 1.59  | 4-8    | 6.35 $\pm$ 2.08  | 1-11   | 0.18    |
| Knowledge score              | 5.58 $\pm$ 1.96  | 2-8    | 6.06 $\pm$ 1.25  | 4-8    | 5.77 $\pm$ 1.72  | 1-8    | 0.37    |

Most of the participants showed enough knowledge about diagnosis and management of syncope/ faint (97.7%) and seizure 82 (95.5%). The level of knowledge of the respondents about other medical emergencies management were as follow: heart attack 77 (79.1%), orthostatic hypotension 60 (69.8%),

hypoglycemic shock 58 (67.4%) supine hypotension of pregnancy 14 (16.3%), angioneurotic edema 14 (16.3%), hyperventilation syndrome 20 (23.3%), asthma attack 22 (25.6%) and thyroid storm 24 (27.9%). (table3)

**Table-3: Frequency of correct and incorrect answers to the questionnaire**

| Type of emergency               | Correct answer N (%) |           |           | Incorrect answer N (%) |           |           |
|---------------------------------|----------------------|-----------|-----------|------------------------|-----------|-----------|
|                                 | male                 | Female    | total     | male                   | Female    | Total     |
| Syncope/ faint                  | 50 (96.2)            | 34 (100)  | 84(97.7)  | 2 (3.8)                | 0 (0)     | 2 (2.3)   |
| Supine hypotension of pregnancy | 10 (19.2)            | 4 (11.8)  | 14 (16.3) | 42 (80.8)              | 30 (88.2) | 72 (83.7) |
| Seizures                        | 50 (96.2)            | 32 (94.1) | 82 (95.3) | 2 (3.8)                | 2 (5.9)   | 4 (4.7)   |
| Orthostatic hypotension         | 40 (76.9)            | 20 (58.8) | 60 (69.8) | 12 (23.1)              | 14 (41.2) | 26 (30.2) |
| Hyperventilation syndrome       | 14 (26.9)            | 6 (17.6)  | 20 (23.3) | 38 (73.1)              | 28 (82.4) | 66 (76.7) |
| Adrenal suppression             | 22 (42.3)            | 28 (82.4) | 50 (58.1) | 30 (57.7)              | 6 (17.6)  | 36 (41.9) |
| Hypoglycemic shock              | 32 (61.5)            | 26 (76.5) | 58 (67.4) | 20 (38.50)             | 8 (23.5)  | 28 (32.6) |
| Thyroid storm                   | 16 (30.8)            | 8 (23.5)  | 24 (27.9) | 36 (69.2)              | 26 (76.5) | 62 (72.1) |
| Angioneurotic edema             | 8 (15.4)             | 6 (17.6)  | 14 (16.3) | 44 (84.6)              | 28 (82.4) | 72 (83.7) |
| Heart attack                    | 43 (65.4)            | 34 (100)  | 77 (79.1) | 9 (34.6)               | 0 (0)     | 9 (20.9)  |
| Asthma attack                   | 14 (26.9)            | 8 (23.5)  | 22 (25.6) | 38 (73.1)              | 26 (76.5) | 64 (74.4) |

Among the 86 dentists, 20 (23.3%) had poor knowledge, 32 (37.2%) had average knowledge, and 34 (39.5%) had good knowledge scores about management of medical emergencies.

**DISCUSSION**

Of 86 participants in this study, 74 (86%) were general practitioners and 12 (14%) were dental specialist, 52 (60.4%) were male and 34 (39.6%) were female.

The average of age and work experience of the male dentists were significantly higher than female dentists ( $p < 0.05$ ), But there was no significant difference between male and female dentists in terms of the average number of patients per day, the number of working hours per day, and the knowledge scores ( $p > 0.05$ ).

The level of knowledge of 20 (23.3%) dentists was poor, 32 (37.2%) was average and 34 (39.5%) was

good. Therefore the level of knowledge of Birjand dentists was not satisfying.

The same results are obtained in the study by Khami *et al.* which reported that less than a quarter of the participants received acceptable scores [13].

Chandrasekaran *et al.* [12] carried out a study to evaluate awareness of basic life support among medical, dental, nursing students and doctors and concluded that their knowledge was very poor and needed to be improved. Similarly, Sudeep *et al.* [16] conducted a study to evaluate the awareness of basic life support among students and teaching faculty in a dental college and concluded that their knowledge needed to be improved and updated. Kumarswami *et al.* warned about the situation [8].

Aroor *et al.* reported that the overall mean score of awareness was  $4.16 \pm 1.40$  (score range: 0-10), that is below average indicating the importance of

professional training at all levels in a tertiary care health institution [9].

In contrast Bell et al reported that overall the responses were positive [10].

Birang et al. noted that the dentists' knowledge was at an average level and they had little access to emergency drugs and equipments [11]. Narayan et al. reported moderate level of awareness [15]. Muller et al. stated that 92% of dentists took part in emergency training following graduation [14].

The highest score of knowledge in the present study belonged to the management of syncope due to injection of local anesthesia (97.7%), that may be because of high incidence of this clinical conditions that cause better preparation of dentists to deal with. Then the highest awareness was in dealing with seizure (95.3%), heart attack (79.1%) and orthostatic hypotension (69.8%).

The level of knowledge about supine hypotension of pregnancy (16.3%) angioneurotic edema (16.3%), hyperventilation syndrome (23.3%), and asthma attack (25.6%) was low. Many studies also reported that the most commonly encountered emergencies seen in dental office is syncope/faints [3, 15, 17-18].

Although the most critical clinical situations for the patient, such as acute myocardial infarction, cardiac arrest and anaphylaxis are the most uncommon [17], nevertheless, the morbidity and mortality of these emergencies in comparison with the others are significant. So that dentists must be adequately prepared to face such critical situations [19]. Another explanation about low awareness of dentists in the present study is that more than half of participants had more than ten years of experience. In the present study, like other studies, there is a negative correlation between experience and level of awareness which indicates that the information on emergency management not updated and the training in this field is not enough. [20-22]. Marks et al. [22] stated that the older the dentist, the less consistent was the updating of medical history. Also Baduni et al. [20] showed that the maximum mean score was obtained by dentists with clinical experience between 1-5 years. Broadbent et al. [21] reported that the younger practitioners reporting a higher number. A likely explanation for this finding is that recent graduates were using sedation more frequently, and that they might be more prepared to treat medically compromised patients in the first place.

Ofilada et al. [23] in a study conducted on diabetic patients stated that a third of the patients blamed the lack of willing dentists to treat diabetic patients as the reason for being unable to obtain dental care and also pointed to fear.

This indicates that improvement of knowledge and advanced preparation for the emergency management of patients is needed. The improvement of knowledge enhances the confidence in the use of drugs and equipments and thus might also lead to more willingness to manage medically compromised patients and preparation to encounter with emergency situations.

This suggests that although training is received in the theoretical aspect of emergencies, participants are not particularly confident to treat emergencies and may require further practical training.

According to The results of this study, considering the following points are essential:

- Intervention to raise awareness of students during dental education and promotion of the knowledge after graduation to update the information of dentists.
- The inclusion of medical emergency course in theoretical and practical form in general and specialty courses in dental curriculum
- Holding educational and practical workshops and the use of the video or simulation to increase the efficiency.
- Providing instructional packages containing the common emergency treatment as films, posters, and pamphlets and so on in retraining courses or other scientific or cultural communities for dental professionals.

## CONCLUSION

The result of this study revealed that the knowledge of dentists about diagnosis and management of dental emergencies was not satisfying. Therefore, we suggest that more attention should be paid to this issue during postgraduate and general courses. In addition, holding theoretical and practical educational courses about approaches to manage medical emergencies results enhances the knowledge of dentists.

## REFERENCES

1. Anders PL, Comeau RL, Hatton M, Neiders ME; The nature and frequency of medical emergencies among patients in a dental school setting. *Journal of dental education*, 2010;74(4):392-396.
2. Amirchaghmaghi M, Sarabadani J, Delavarian Z; Preparedness of specialist dentists about medical emergencies in dental office-Iran. *Australian Journal of Basic and Applied Sciences*, 2010; 4(11):5483-5486.
3. Girdler N, Smith D; Prevalence of emergency events in British dental practice and emergency management skills of British dentists. *Resuscitation*, 1999; 41(2):159-167.
4. Shenoy N, Ahmed J, Ongole R, Boaz K, Srikant N; Are dental surgeons prepared for medical emergencies. *International Journal of Biomedical Research*. 2013; 4(9):461-464.

5. Malamed SF; Emergency medicine in pediatric dentistry: preparation and management. CDA JOURNAL. 2003; 31(10):749-755.
6. Peskin RM, Siegelman LI; Emergency cardiac care. Moral, legal, and ethical considerations. Dental clinics of North America, 1995; 39(3):677-688.
7. Kumar K, Mukhi CS; Basic Resuscitation in Dental Office: A Review. IJSS Case Reports & Reviews. 2014; 1(4):22-25.
8. Kumarswami S, Tiwari A, Parmar M, Shukla M, Bhatt A, Patel M; Evaluation of preparedness for medical emergencies at dental offices: A survey. Journal of International Society of Preventive & Community Dentistry, 2015; 5(1):47.
9. Aroor AR, Saya RP, Attar NR, Saya GK, Ravinanthanan M; Awareness about basic life support and emergency medical services and its associated factors among students in a tertiary care hospital in South India. Journal of emergencies, trauma, and shock, 2014; 7(3):166.
10. Bell G, James H, Kreczak H, Greenwood M; Final-Year Dental Students' Opinions of Their Training in Medical Emergency Management. Primary dental journal, 2014; 3(1):46-51.
11. Birang R, Kaviani N, Behnia M, Mirghaderi M; Isfahan dentists' readiness for medical emergencies: their knowledge and access to necessary equipments. Iranian Journal of Medical Education, 2005; 5(2):47-54.
12. Chandrasekaran S, Kumar S, Bhat SA; Awareness of basic life support among medical, dental, nursing students and doctors. Indian journal of anaesthesia, 2010; 54(2):121.
13. Khami M, Yazdani R, Afzalimoghaddam M, Razeghi S, Moscowchi A; Medical Emergency Management among Iranian Dentists. The journal of contemporary dental practice, 2013; 15(6):693-698.
14. Müller M, Hänsel M, Stehr S, Weber S, Koch T; A state-wide survey of medical emergency management in dental practices: incidence of emergencies and training experience. Emergency Medicine Journal, 2008; 25(5):296-300.
15. Narayan DPR, Biradar SV, Reddy MT; Assessment of knowledge and attitude about basic life support among dental interns and postgraduate students in Bangalore city, India. World journal of emergency medicine, 2015; 6(2):118.
16. Sudeep C, Sequeira P, Jain J, Prataap N, Jain V, Maliyil M, Awareness of emergency drugs uses among students and teaching faculty in a dental college in Coorg, Karnataka. Journal of Indian Association of Public Health Dentistry, 2014; 12(3):185.
17. Arsati F, Montalli VÂ, Flório FM, Ramacciato JC, da Cunha FL, Cecanho R, et al.; Brazilian dentists' attitudes about medical emergencies during dental treatment. Journal of dental education, 2010; 74(6):661-666.
18. Jodalli PS, Ankola AV; Evaluation of knowledge, experience and perceptions about medical emergencies amongst dental graduates (Interns) of Belgaum City, India. Journal of clinical and experimental dentistry, 2012; 4(1):14.
19. Malamed SF, Medical emergencies in the dental office: Elsevier Health Sciences, 2014.
20. Baduni N, Prakash P, Srivastava D, Sanwal MK, Singh BP, Awareness of basic life support among dental practitioners. National journal of maxillofacial surgery; 2014; 5(1):19.
21. Broadbent J, Thomson W; The readiness of New Zealand general dental practitioners for medical emergencies. New Zealand Dental Journal, 2001; 97:82-86.
22. Marks LA, Van Parys C, Coppens M, Herregods L; Awareness of dental practitioners to cope with a medical emergency: a survey in Belgium. International dental journal. 2013;63(6):312-16.
23. Ofilada E JL, Jimeno CA; A Survey on the Barriers to Dental Care Among Individuals with Type 1 Diabetes. Endocrinology, 2013; 51(2).