



Evaluation of Knowledge and Experience among Oral and Maxillofacial Surgeons about Cardiopulmonary Resuscitation

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ABSTRACT

Objective: This study was undertaken to assess the level of knowledge and experience about CPR among oral and maxillofacial surgeons.

Materials and methods: In a cross-sectional study, a total of 96 professionals (31-PGs, 65-MDS staff) were surveyed using a self-administered structured questionnaire pretested through a pilot survey. The data was analyzed using the SPSS version 15.0. The Student's t-test and ANOVA test were used as test of significance. The level of significance was set at $p \leq 0.05$.

Results: In the present study, 78% of oral surgeons had received training about CPR but only 52.0% have proper practical knowledge of performing it. As there were some cases due to CPA in dental practice even then half of the participants take history of patients regarding this. A significant difference was found according to designation with PGs having lower mean scores. A positive linear correlation was found between years of experience and knowledge about CPR (Pearson's correlation, $r = 0.613$, $p = 0.00$).

Clinical significance: The present findings showed that practical knowledge of performing CPR is still low and half of them still do not take history regarding this. So there is need for more knowledge about CPR through CDE programs.

Keywords: Oral surgeons, Cardiopulmonary arrest, Cardiopulmonary resuscitation.

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INTRODUCTION

Cardiac diseases are one of the most prevalent diseases worldwide and are characterized by high rate of mortality and morbidity. According to the World Health Organization,

cardiovascular diseases cause 12 million deaths in the world each year whereas in India, 27% of deaths are because of cardiovascular diseases. Cardiopulmonary arrest (CPA) is one of the most common cardiovascular diseases. It is the abrupt, unexpected cessation of respiratory movement or effective circulation. Most people with cardiopulmonary arrest die before reaching hospital.¹ So in order to save the lives of these patients, first aid in the form of cardiopulmonary resuscitation (CPR) must be immediately given to the patient as it forms part of the 'chain of survival' and 'buys time' until more definitive therapy is available.²

Cardiopulmonary resuscitation is an emergency procedure consisting of external cardiac massage and artificial respiration which is performed in an effort to manually preserve intact brain function to restore spontaneous blood circulation as the central nervous system will show irreversible lesions, if anoxia lasts for more than 3 to 4 minutes. Hence, its main purpose is to restore partial flow of oxygenated blood to the brain and heart to delay tissue death and to extend the brief window of opportunity for a successful resuscitation without permanent brain damage.³

Though unusual, there are reports of deaths due to CPA in dental offices during dental treatment.⁴ Little has been published about competence of dentists to deal with CPA, or the occurrence of resuscitation emergencies in dental practice⁵ and considering the seriousness of the situation, training in the management of cardiac arrest is considered an essential component among dental professionals, with recommendation for annual training in cardiopulmonary resuscitation.⁶ All members of a dental team must be trained and prepared to administer CPR, and there should be frequent practice of resuscitation routines.⁷ Besides training in basic techniques of resuscitation, such as mouth-to-mouth respiration and chest compression, other procedures can also

be useful, such as the use of a laryngoscope, an oropharyngeal tube, an Ambu mask, an oxygen balloon, and drugs such as adrenaline.⁸ Dentists with patient contact obviously need to maintain competence in resuscitation throughout their careers. Although resuscitation emergencies are distinctly uncommon in dental surgery, dentists should be able to apply appropriate basic life-support resuscitation skills if required.⁹ Thus, the objective of this study was to determine the level of knowledge about cardiopulmonary resuscitation and its practical implementation among oral and maxillofacial surgeons.

MATERIALS AND METHODS

Study Population

The present study was carried out during June to August 2012 to evaluate knowledge and experience of cardiopulmonary resuscitation among oral and maxillofacial surgeons.

Before the commencement of the study ethical approval was obtained from Ethical Committee of Sibar Institute of Dental Sciences, Guntur, India

A total of 110 oral and maxillofacial surgeons participated in the survey from different dental colleges including 31 (32.2%) postgraduate students and 65 (67.8%) MDS staff members. The mean age of the participants was 29.48 years.

Questionnaire Design

A self-administered, structured, close-ended questionnaire written in English was prepared. The questions were pre-tested among a group of 10 oral surgeons in order to ensure the level of validity and degree of repeatability (Cronbach alpha = 0.78). The questionnaire sought information on demographic variables and other questions like have you undergone any formal training in cardiopulmonary resuscitation, do you know correct procedure of CPR, ever seen a patient suffering from CPA in your dental practice, do you take history of patient regarding CPA, have you ever met with causality due to CPA in your practice, cardiac arrest is confirmed by, surface on which cardiac compression is performed, have you ever done mouth to mouth breathing, knowledge about ECG, life saving drugs, willing to attend CDE program on CPR.

Methodology

The subjects were visited by a single examiner and all the available and willing subjects were included and those who were belonging to specialty other than oral and maxillofacial surgery were excluded from the study. The participants were asked to respond to each item according to the response format provided in the questionnaire.

Data Analysis

The proformas were arranged systematically and information was transferred from the survey proforma to a computer. A master chart was created in Microsoft Excel (2007) for the purpose of data analysis. The statistical software namely SPSS version 15.0 was used for the analysis of the data. For data analysis, each positive response was given a score '1' and each negative response was assigned as a score of '0'. The individual scores were summed up to yield a total score. Descriptive statistics were obtained and frequency distribution, means, standard deviation were calculated for knowledge and experience regarding CPR. The student's t-test, ANOVA test were used as tests of significance for statistical evaluation of means. Karl Pearson's correlation was used to assess the relation of knowledge and years of experience. The level of significance was set at $p \leq 0.05$.

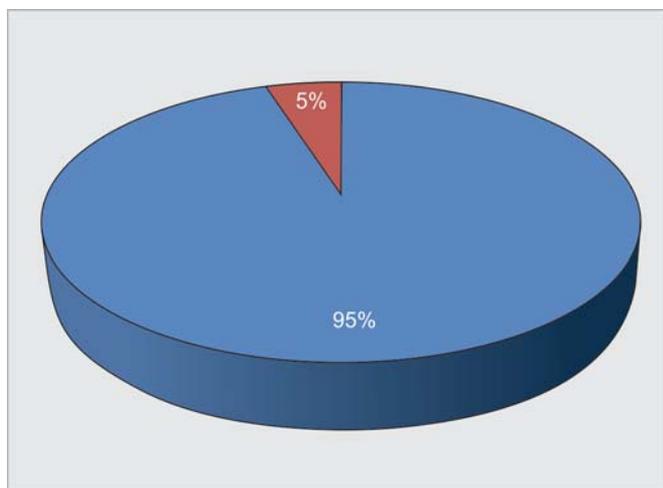
RESULTS

The distribution of the study subjects according to their designation, gender and experience is demonstrated in Table 1. In the present study, it was found that around 78% had undergone training of CPR, but only 52% have proper practical knowledge of performing it. Majority of the subjects gave correct answer as regards the surface on which cardiac compression should be performed (92.6%). While checking their knowledge on ECG more than half of the subjects were able to give correct response. Around 50% take history of the patients regarding CPA before starting the case and only 12% have seen patients suffering from CPA in their practice. When it was asked about confirmation of cardiac arrest 68% gave right answer and also majority of them were having the knowledge of life saving drugs. In the present study only 16% have performed mouth to mouth breathing and none of the participant ever met with any causality in their dental practice. Most of the oral surgeons (95%) showed positive response, when it comes to attending continuing dental education programs on CPR (Graph 1).

In the present study, MDS staff had a higher knowledge of CPR compared to postgraduate students ($p < 0.001$), as shown in Table 2. No statistically significant difference was

Table 1: Distribution of subjects according to designation, gender and years of experience

Characteristics	Number	Percentage	
Gender	Male	58	60.4
	Female	38	39.6
Designation	PG students	31	32.2
	MDS staff	65	67.8
Experience	0-5 years	42	43.8
	6-10 years	43	44.8
	≥ 11 years	11	11.4



Graph 1: The percentage of participants interested in attending continuing dental education program on CPR

found between the mean percentage knowledge scores according to gender as shown in Table 3. According to years of experience, the mean scores of knowledge about CPR were higher among the age group of 6 to 10 years followed by ≥11 and 0 to 5 years age group ($p < 0.001$) (Graph 2).

Table 2: Knowledge and experience of CPR according to designation

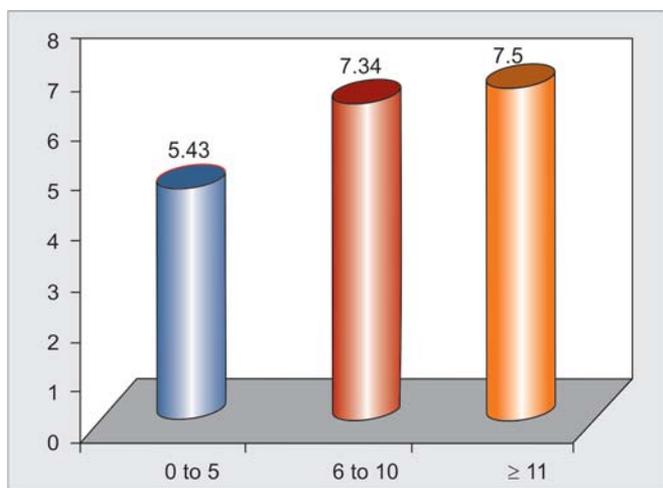
Designation	No.	Mean	Std. deviation	p-value
Postgraduate students	30	5.17	1.367	0.000*
MDS staff	66	7.33	0.730	—

Test used: Student's t-test; *Significant

Table 3: Knowledge and experience of CPR according to gender

Gender	No.	Mean	Std. deviation	p-value
Males	58	6.55	1.202	0.214**
Females	38	6.82	1.658	—

Test used: Student's t-test; ** Not significant



Graph 2: Knowledge and experience of CPR according to years of experience (test used: ANOVA, *significant)

Table 4 shows that the mean knowledge scores of 0 to 5 years experienced group were significantly lowest amongst all. There was no statistically significant difference in the knowledge scores of 6 to 10 and ≥ 11 years aged group.

Among all the participants, we found a positive linear correlation between years of experience and knowledge about CPR (Pearson correlation, $r = 0.613$, $p = 0.00$) as mentioned in Table 5.

DISCUSSION

Oral and maxillofacial surgeons are one of the important members of our health care system. They play a vital role in the institutional care of the patients, including the ones who undergo emergency and intensive care. The patients at the emergency and intensive care units are likely to develop a cardiopulmonary arrest that can occur even in a normal individual who does not even have a cardiac problem. Deaths were reported because of CPA in dental practice.¹⁰ Lack of training and an inability to deal with these emergencies can lead to tragic consequences with legal ramifications.

The present study evaluated the knowledge and personal experience of oral and maxillofacial surgeons toward CPR. In general, the theoretical knowledge was found to be above average, but only half of the participants have practical knowledge of performing CPR which is comparable to the study conducted by Singh et al in 2011.¹¹ However, other study conducted by Kavari et al in Iranian dentists showed that only 37% have proper knowledge regarding this.¹²

In the present study, around 80% have undergone training of CPR which is higher than other study conducted by Chapman's et al in 1997 among Australian dentists.⁵

Table 4: Comparison in between years of experience and knowledge about CPR

Experience (I)	Experience (J)	Mean difference (I-J)	p-value
1	2	-1.911	0.000*
	3	-2.071	0.000*
2	1	1.911	0.000*
	3	-0.160	0.922**
3	1	2.071	0.000*
	2	0.160	0.922**

1: 0-5 years; 2: 6-10 years; 3: ≥11 years; Test used: Post hoc tests; *Significant, **Not significant

Table 5: Correlation between years of experience and knowledge about CPR

	Mean	Std. deviation	p-value
Experience	1.72	0.610	0.000*
Knowledge about CPR	6.66	1.398	—

Test used: Karl Pearson's correlation; *Significant

The reason behind this could be that oral surgeons are more involved in emergencies than normal dental practitioners.

The overall prevalence of cardiac arrest in the dental practice was much higher in the present study compared to the previous study (4%) done by Kavari et al.¹² It was found that more than 90% of participants were interested in attending continuing dental education programs on managing CPA, which was quite similar to other studies.^{6,11}

The findings of this study was higher than other studies while assessing knowledge on ECG and surface on which cardiac compression should be performed.¹³ In the present study, when results were evaluated according to gender, females had slightly higher mean scores than males which was in contrast to the study conducted by Singh et al.¹¹ Similarly, experienced practitioners and MDS staff had higher mean scores than junior ones which is in contrast to Parajulee et al among nurses in Nepal in 2011.¹³ The reason behind these results could be that seniors have more opportunities to treat special cases and access training for CPR and also oral surgeons have more knowledge than nursing profession.

CONCLUSION

The present study evaluated that the levels of practical knowledge and experience about CPR was not up to the mark and it suggests the need for regular continuing dental education programs. It is imperative that the knowledge and skills required are disseminated to all oral surgeons effectively in the interest of improved patient mortality following cardiac arrest.

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