

PHYSICIANS' COMPETENCE IN TERMINATING CPR IN CARDIAC ARREST CASES AND FACTORS INFLUENCING THIS TERMINATION

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(Received, 27th November 2022, Revised 26th March 2023, Published 26th May 2023)

Abstract: *The study aimed to evaluate the competence and knowledge of the cardiac arrest team regarding CPR termination and the factors that influence this termination. A cross-sectional study was conducted in the Department of Cardiology, Shifa International Hospital April 2022-April 2023). A total of 300 cardiac arrest team members (physicians and nurses) designated to perform advanced cardiac life support were included in the study. Questionnaires were distributed among the participants inquiring about their competence and knowledge about terminating CPR. Of 100 physicians, 40 (40%) were not competent enough to decide on CPR termination. 10% of physicians and 5% of nurses agreed to be aware of the ERC termination guidelines, and only one physician and one nurse could state the contents. The majority of the participants reported terminating resuscitation if the patient was older than 90 years, absent direct pupillary reflex, true asystole, and witnessed cardiac arrest without bystander resuscitation in 10 minutes. Based on the results, the physicians and nurses in Pakistan are not competent in decision-making regarding CPR termination in cardiac arrest patients and are unaware of the factors and guidelines while making such decisions.*

Keywords: Cardiopulmonary Resuscitation, Cardiac Arrest, End-Of-Life Decisions

Introduction

Cardiac arrest has a very low survival rate in patients worldwide. Survival to discharge ranges from 18-28% in hospitals (de Visser et al., 2019; Schlupe et al., 2018). In Pakistan, only 1 in 100 people survive cardiac arrest (Ahmed et al., 2022). Cardiac arrests without hospital admission have a survival to discharge of approximately 10% (Myat et al., 2018). However, the healthcare staff needs to determine the termination of resuscitation. The head physician mostly makes this decision, but the nurses and other physicians often offer their expertise. Hospitals that take a long to terminate resuscitation often have high survival rates. Hence, hospital staff must be aware of the termination guidelines, and hospital authorities should provide this knowledge to increase the probability of successful resuscitations.

In Pakistan, however, cardiac arrest staff, including the head physician, is inexperienced (Irfan et al., 2019). Research has revealed that in the absence of an experienced head, the junior staff is not well-trained to make critical decisions in cardiac arrest cases, and they often have poor knowledge of the protocol to be followed (Umhuza et al., 2021). It is worth investigating the competence of cardiac arrest teams regarding resuscitation and basic awareness about the termination of CPR. Many studies have been

conducted to assess the termination of CPR, but what factors influence these decisions is still unknown. Therefore, this study aims to evaluate the competence and knowledge of the cardiac arrest team regarding CPR termination and the factors that influence this termination.

Methodology

A cross-sectional study was conducted in the Department of Cardiology, Shifa International Hospital April 2022-April 2023). A total of 300 cardiac arrest team members (physicians and nurses) designated to perform advanced cardiac life support were included in the study. All the participants provided their consent to become a part of the study. The participants who refused or failed to respond were excluded. The ethical board of the hospital approved the study design.

Questionnaires were distributed among the participants, and their identity was kept anonymous. The questionnaire consisted of four sections. The first section included questions about educational and professional background and former CPR training. The second section questioned about self-assessed competence of participants regarding CPR termination. The third section inquired whether the

participant knew the ERC termination guidelines; if they did, they were asked to elaborate. The last section listed 14 single factors, and the participant was asked to answer yes/no accordingly if that factor would lead them to terminate CPR.

R Statistics assessed all the data. Mean and standard deviation was used to present normally distributed data, and the median was used to present non-normally distributed data. Chi-squared test was used to assess categorical data. A probability value of less than 0.05 was regarded as statistically significant.

Results

A total of 300 responses from participants were included. Participants were divided into physicians and nurses. 50% nurses included were from the

cardiology department, 20% from the intensive care unit, 20% from anesthesiology, and 10% from general wards. Of 100 physicians, 40 (40%) were not competent enough to decide on CPR termination. 10% of physicians and 5% of nurses agreed to be aware of the ERC termination guidelines, and only one physician and one nurse could state the contents.

The mean age of physicians and nurses was 37 and 40, respectively. 68 (68%) physicians had a training of more than one year, and 158 (90%) had been trained more than 12 months (Table I). The majority of the participants reported terminating resuscitation if the patient was older than 90 years, absent direct pupillary reflex, true asystole, and witnessed cardiac arrest without bystander resuscitation in 10 minutes (Table II). Physicians' and nurses' data did not differ statistically.

Table I: Baseline data of participants

	Physicians (n=100)	Nurses (n=200)
Age	37 (6.6)	40 (8.8)
Female sex	55 (55%)	180 (90%)
Former CPR training		
Less than 1 year	25 (25%)	28 (15%)
More than 1 year	68 (68%)	158 (85%)
Years since graduation	8 (3,11)	12 (6,22)

Table II: Impact of single factors on the decisions of participants

Factors	Physicians		Nurses	
	Yes	Undecided	Yes	Undecided
Prolonged CPR with a persistent shockable rhythm	8 (8%)	7 (7%)	36 (18%)	32 (16%)
DNR order	95 (95%)	5 (5%)	170 (85%)	10 (5%)
Hypothermia below 30°C	2 (2%)	5 (5%)	4 (2%)	22 (11%)
Old age (>90 years)	18 (18%)	6 (6%)	32 (16%)	22 (11%)
True asystole	18 (18%)	16 (16%)	39 (19.5%)	38 (19%)
Absent direct pupillary reflex	17 (17%)	6 (6%)	45 (22.5%)	32 (16%)
Tumors	14 (14%)	6 (6%)	16 (8%)	24 (12%)
Severe hyperkalemia	11 (11%)	5 (5%)	12 (6%)	29 (14.5%)
ETCO ₂ <1.33kPa	10 (10%)	25 (25%)	6 (3%)	80 (40%)
Old age (>80 years)	5 (5%)	4 (4%)	8 (4%)	20 (10%)
Witnessed arrest with no bystander CPR in 10 minutes	22 (22%)	7 (7%)	30 (15%)	29 (14.5%)
Unwitnessed cardiac arrest	4 (4%)	9 (9%)	8 (4%)	28 (14%)
Aspiration during resuscitation	3 (3%)	5 (5%)	4 (2%)	24 (12%)
Flatline for less than 20 minutes, advanced cardiac life support, and hyperkalemia as the cause of cardiac arrest	75 (75%)	8 (8%)	100 (50%)	20 (10%)

Discussion

We conducted a study to assess the competence of the cardiac arrest team to terminate resuscitation. The responses showed that 1/3rd of the physicians and nurses were not competent to make decisions during emergence. Only 1 of 10 physicians knew the CPR guidelines, and nearly none could define its contents.

Previous studies also report the indecisiveness of physicians in the cardiac arrest team (McAuliffe and Gledhill, 2022; Requena-Mullor et al., 2021).

The knowledge gap about terminating resuscitation was far more than the lack of knowledge in other resuscitation and cardiac events (Baldi et al., 2020; Majid et al., 2019). The healthcare staff was more

confident in answering questions about medications and drugs. More than 50% of physicians and nurses could provide correct information about drug action during cardiac arrest. However, our results suggest a dire need to educate staff about resuscitation guidelines and protocols.

Almost all the physicians and nurses agreed to terminate resuscitation in the presence of a DNR order or continuous asystole. Staff had variable views regarding other factors. Other studies reported age and direct pupillary reflex as important factors in determining termination (Botes and Moepeng, 2020). In our study, few staff agreed on terminating resuscitation in the absence of pupillary reflex. The guidelines state that still, pupils should not be a basis for termination (Perkins et al., 2018).

Similarly, cardiac standstill is indirectly proportional to spontaneous circulation; hence is observed in both survivors and non-survivors (Kim et al., 2016). According to research, cardiac arrest patients have 3-4 folds more chance of survival if initial cardiac activity is reported (Gaspari et al., 2016). These patients receive long resuscitation attempts, and 10% of patients with cardiac standstill survived, proving that ultrasound findings are not definite (Aagaard et al., 2017). Thus, ultrasound findings should not be a basis for terminating CPR. In our study, 18 (18%) physicians and 39 (19.5%) nurses agreed to use it as a factor for termination.

The participants also responded that they would terminate CPR if the patient had prolonged cardiac arrest with a shockable rhythm, violating the guidelines (Soar et al., 2021). In another study, 8% of resuscitations were terminated in a shockable rhythm (Hansen et al., 2018). Another study also reported that healthcare staff terminates CPR instead of weighing the chances of survival by assessing factors (Bradley et al., 2017). Our study also observed this; some factors were misused and misinterpreted to make termination decisions.

Our study has some limitations. By recording responses by questionnaires, we concluded the respondents' perspectives. We only recorded results according to the influence of a single factor, but in practice, multiple factors are considered for termination.

Conclusion

Physicians and nurses in Pakistan are not competent in decision-making regarding CPR termination in cardiac arrest patients and are unaware of the factors and guidelines while making such decisions.

Conflict of interest

The authors declared absence of conflict of interest.

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