CPCR Results in Cardiac Arrested Patients in Motahari Hospital Affiliated to Jahrom University of Medical Sciences, Iran, 2011-2015

Shohreh Javadpour¹, Hasan Askari¹, Najme Sadeghi², Neda Pournorooz¹, Mohsen Hojat¹*

¹Research center for social Determinants of Health, Nursing Faculty, Jahrom University of Medical Sciences, Jahrom, Iran.

²Research Center for Non-communicable Diseases, Jahrom University of Medical Sciences, Jahrom, Iran

*Corresponding Author: Mohsen Hojat

Abstract

Introduction Cardiopulmonary resuscitation (CPR) in hospital has received much attention over the last decade. Computing international indices of CPR in hospital can be a guideline for researchers and managers in determining the executive and research priorities. So this study was designed and implemented to evaluate the results of CPR in Motahari Hospital in Jahrom. Materials and Methods this study was a cross-sectional and analytic study that designed and implemented in Motahari Hospital affiliated with the Jahrom University of Medical Sciences during 2011-2015. All patients receiving resuscitation were evaluated each year and in each section as the census regardless of the background factors; and information was collected through cardiopulmonary resuscitation checklist which was filled by clinical supervisor and hospital resident doctor per shift. Content and face validity was calculated according to opinion of 5 professors, content validity index (0.77), and the content validity ratio (0.83); reliability of the tool was calculated through education of clinical supervisors and acquisition of Kappa coefficient to researchers (96%). Data were analyzed by SPSS16 software. Results In this study, resuscitation was annually performed on 353 patients from 389 cases during 2011-2015, that the patients were 78.61% males and 21.39% females with an age range of 1-98 years and an average age of 55.6 years. Of the total cases conducted resuscitation, successful resuscitation was 56.29% at 24 hours and return of spontaneous blood circulation was 63.03% at first 20 minutes. Average total of duration of resuscitation was reported 59.58 minutes. Conclusion the results of this study are consistent with the results of European and America countries. It also shows that the faster resuscitation start and quick and correct use of defibrillator can improve short-term and long-term indicators of resuscitation.

Keywords: Cardiopulmonary resuscitation (CPR), ROSC - S to D.

Introduction

Patients with cardiac arrest have survival chance if resuscitation is carried out accurate and timely [1]. Over the last decade, survival-to-discharge rate is mentioned about 15% in several studies [2]. Of course, there are many factors is effective on the success of cardiopulmonary resuscitation such as: access to basic and advanced resuscitation, the proper equipments like defibrillators, the capability of resuscitation team, and patient’s background conditions [3]. If resuscitation is started within 4 minutes and shocked within 8 minutes, the chance of successful resuscitation will increase. In some studies suggest that they could reach 30-40% successful resuscitation rate with measures such as reducing the time to start resuscitation and extensive and practical training of CPR [4]. Herlitz states that patients who suffered a cardiac arrest in hospital have 4 times the survival chance more than patients who suffered arrest outside.
hospital; however, some studies have suggested the opposite [5, 6]. Some researchers have known the cause of the decline because of variables related to the patient (patient’s health basic conditions) before the arrest [7-9]; the poor conditions of hospitalized patients in hospitals are included; breathing critical condition, untreatable cardio-respiratory disorders, malignancies, irreversible damages to the nervous system, old age, etc. [10].

Of course, in the meantime, other mentioned factors such as the capability and skill of the resuscitation team and the required equipment should also be noted [4, 11]. However, there are few studies about the success rate of CPR in hospitals in Iran. This study aimed to investigate the relationship between some variables before resuscitation in the success rate of CPR in hospital.

**Material and Methods**

This study is a cross-sectional and analytical study which was performed in Motahari Hospital of Jahrom University of Medical Sciences, Iran in 2011-2015. The hospital is servicing as a specialized center for gynecology with 206 beds in southern Iran with an average bed occupancy rate of 71.69% and the average annual admission listing of 31427.66.

All patients receiving resuscitation were retrospectively evaluated in each year and in each sector as the census, regardless of background factors; and the information was collected through cardiopulmonary resuscitation checklist filled by clinical supervisor and hospital resident doctor per shift. Several checklists were separately filled for patients with several resuscitations.

Checklist had 53 items that it includes all medical and demographic information of the patients, the regeneration process, the resuscitation team, used drug, and critical times. Content and face validity was calculated according to the opinion of 5 professors, content validity index (0.77), and the content validity ratio (0.83) that was acceptable in accordance with the Law she table. Reliability of the tool was calculated through education of clinical supervisors and acquisition Kappa agreement coefficient for researchers (96%). Data were analyzed by SPSS16 software.

**Results**

In this study, on average 389 cases of resuscitation had annually been conducted on 353 patients during 2011-2015, that 78.61% were male and 21.39% were females aged between 1-98 years and an average age of 55.6. Of total performed resuscitation cases, Successful resuscitation at 24 hours and the response at first 20 minutes were 56.29% and 63.03%, respectively (Table 1). The average duration of resuscitation was reported 59.58 min. In total, 51.72% of patients recovered, survived, and discharged; and 7.35% of them were referred to specialized centers or other hospitals.

Significant difference between the studied variables including ROSC S to D (Return of Spontaneous Circulation (ROSC) - Survival to Discharge (S to D)) between two sexes by chi-square test did not show a significant difference (p = 0.29, p = 0.18).

By Spearman test, any statistical significant correlation was not observed between Schiff and ROSC -S to D - (p = 0.61, r = 0.16) and (p = 0.45 r = 0.12), respectively.

By chi-square test, a statistical significant correlation was observed between ROSC- S to D- survival in the first 24 hours and 6 minutes before starting CPR (p = 0.021, p = 0.018, p = 0.04), using the defibrillator in the first 10 minutes (p = 0.026, p = 0.035, p = 0.031) and the resuscitation of more than 30 minutes (p = 0.023, p = 0.017, p = 0.014).
Discussion

With the evaluation of the expansion of ROSC from 55.55% in 2011 to 66.98% in 2015, we will realize growth of 11.43% in this international index in Motahari hospital. The results of the study are higher than the results of Müller in Germany (48%), Chan in China (32%), Toledo in Brazil (57%), Akhtar and Tarmey in UK (38%) and (27%), respectively, Ong ME in Singapore (31%), Shadhi in India (24%) and are closer to the results reported by Mentzelopoulos in Greece (75% and 66%), Müller in Germany (72%), Chon in Korea (63%), Chakravarthy in India (64%) [12-20].

However, we can only be awarded about the temporary and unstable return of spontaneous circulation by assessing such indicators, being high such an index can indicate the high quality of CPR and high speed operation of resuscitation team and other personnel in the diagnosis sector and timely action. However, what provides the ability to discuss such indicator is considering more lasting and stable results in cardiopulmonary resuscitation such as survival in the first 24 hours after resuscitation and discharge in hospital after resuscitation.

The average of 24-hr survival rate of patients was significant after cardiac arrest in hospital during 5 years (56.29%), and the rate in the 5-year study increased 14.66 percent between 2011 and 2015. So that the annual average rate is more than the results reported by Bolandparvaz et al. [20] in Shiraz Namazi Hospital in Iran and other studies that declared 24-hr survival rate of 13.4-32.2% [21-24].

The average rate of S to D was significant within 5 years (51.721%), and the rate increased 18.35% between the years 2011 and 2015 in the 5-year study. This rate is higher than the results reported in different studies in other countries, including Germany, Korea, China, Japan, Brazil, Britain, Singapore, India, Egypt, and Greece that have reported S to D results of 5-40% [14-25].

This large difference can be related to patients’ type, the studied age range, documented quality of the results of successful resuscitation (various measurement tools), the presence of the resuscitation team in hospital, and many other components. But the important point that perhaps could bring good results for Motahari hospital is practical trainings based on the principles of adult education and nursing and medical expertise’s consultation to all members of the resuscitation team and personnel jointly, that it was broadly held in the hospital over a long-term action research program (4 years).

Interpretation of these indicators will be more obvious when the start resuscitation statistics before 6 minutes are considered and the average resuscitation in the first 6 minutes (70.69%) is matched with statistics of the use of defibrillator in the first 10 minutes (72.39%).

In the other words, according to the America Heart Association guidelines (AHA) 2015, starting as soon as the resuscitation, and timely and proper utilization of the defibrillator can improve the resuscitation outcomes and survival of patients can be increased in the first 24-hr that is the most dangerous time for patient. According to the reliable references in cardiopulmonary resuscitation and articles, it seems that identifying patients at risk for resuscitation in hospital and practical and team trainings can improve patient survival.

As well as various studies focus on earlier and more effective use of the defibrillator and suggest that every minute of delay in resuscitation decreases 5-10% a patient’s chance of survival.

In this study, the scientific finding is confirmed which there are clinically and statistically significant relationship between performing faster resuscitation and quick and correct use of defibrillation with short-term and long-term response of resuscitation [23-29].

As well as, there are some significant factors which are effective including consideration to the cardiopulmonary resuscitation index as an indicator of hospital by the office of quality improvement in hospitals, nursing
office of treatment deputy as the two managing and promoting poles of quality and attention of the university management team to the discussion of the indicators of the improvement of quality in the provision of service in hospitals.

Because the attention to the discussion of indicators and their measurement in long-term can practically make obvious the results of training programs in clinic. And it promotes the condition for performing continuous programs and provides the improvement of therapeutic indices.

The limitations of this study include non-calculated indices of care after resuscitation in the special and public sectors as well as non-calculated indices of resuscitation outside the hospital.

Conclusion
The results of the present study reveal the high rate of indicators related to the results of cardiopulmonary resuscitation during the five years that is in line with the results of in European and American countries. They also show that the faster resuscitation start and the quick and correct use of defibrillation can improve the short-term and long-term indicators of resuscitation.

Acknowledgement
This study was adopted with code of 394240 and code of ethics jums.ethic.1393/92 in Jahrom University of Medical Sciences. Thus, we appreciate all hospital personnel and hospital management, as well as the statistical unit's staffs of Motahari Hospital who helped us in conducting this study.

References


13. Chan JC, Wong TW, Graham CA (2013)Factors associated with survival after...


