

ARTYKUŁ ORIGINALNY/ORIGINAL PAPER

Otrzymano/Submitted: 06.05.2013 • Poprawiono/Corrected: 06.08.2013 • Zaakceptowano/Accepted: 18.09.2013

© Akademia Medycyny

Nurses' skills assessment in administering cardiopulmonary resuscitation (CPR) to an adult**Tomasz Ilczak^{1,2}, Monika Mikulska¹, Michał Cwiertnia^{1,2}, Szymon Białka³, Beata Kudlacik¹, Jarosław Rutkiewicz¹**¹ Department of Nursing and Emergency Medical Services, Faculty of Health Sciences, Academy of Technology and Humanities in Bielsko-Biała² Bielsko-Biała Emergency Services³ Department of Anesthesiology, Intensive Care and Emergency Medicine, Medical University of Silesia**Abstract**

Background. Performance of cardiopulmonary resuscitation (CPR) on an adult is the foundation for life-saving activities. The research conducted over a number of years has shown that proper performance of basic life support resuscitation algorithm is the key to restoring spontaneous blood circulation and breathing in a person. Nurses are quite often the first to be faced with the necessity to initiate cardiopulmonary resuscitation. Hence, it is vital that their level of knowledge of CPR procedure meet high standards. **Material and methods.** This study describes assessment of practical skills in performing cardiopulmonary resuscitation, carried out among 50 nurses. The key elements of life support activities and the knowledge of particular components of the CPR algorithm have been subjected to assessment. **Results.** The obtained results are not satisfactory, the level of knowledge and skills among the sample group is insufficient to properly implement the CPR algorithm. *Anestezjologia i Ratownictwo 2013; 7: 285-288.*

Keywords: nurses, basic life support, education

Introduction

Sudden cardiac arrest (SCA) in adults is an often cause of deaths in Europe [1]. Depending on etiology, SCA is recognized in 350,000-700,000 adult Europeans during a year [2]. The research that has been conducted over a number of years clearly indicates that resuscitation undertaken immediately after recognizing sudden cardiac arrest (SCA) significantly improves the survival outcome [3]. Having analyzed findings made by researchers in the field of cardiopulmonary resuscitation, proper performance of basic life support algorithm in people with SCA substantially increases the chances of restoration of basic life support functions [2]. In this way the essence and importance of application of car-

diopulmonary resuscitation algorithm can be asserted.

While analysing the situation of nurses working on a daily basis in various types of health care centres, it may be assumed that they are the first to have contact with a patient requesting medical assistance. Literary sources report that hospitals or other healthcare facilities are the places where sudden cardiac arrest events occur quite often [4]. Where this is the case, the survival rate for SCA survivors ranges between 5% and 37%. Such marked discrepancy between the obtained results is attributed by the authors to the fact that the CPR knowledge demonstrated by the first-contact personnel is varied and in many cases insufficient. Therefore the aim of the study is to assess the ability to perform basic life support by nurses in-hospital cardiac arrest.

Material and methods

The research was carried out among a group of fifty nurses. It was anonymous, voluntary and consented to by all participants. A practical test checking skills in proper performance of manual resuscitation on an adult was applied as a tool. The simulation included, performing CPR by one person at a time 5 minutes. A mannequin (AmbuMan wireless – Ambu CPR software version 3.1.1) of an adult, equipped with a module monitoring the performed rescue activities was used. Selected elements of the CPR procedure were subjected to detailed assessment. The correctness of performing airway patency restoration and chest compression were assessed, while taking into account the proper place, rate and depth of compressions. Analyzed elements are the most important parts of the proper resuscitation were therefore analyzed in detail. The knowledge of procedures with attention given to the order of performed elements, i.e. ensuring personal safety of the rescuer, starting resuscitation with a sequence of chest compressions and immediate activation of specialized emergency response system immediately after recognition of breath arrest. All assessed com-

ponents were analysed in respect of compliance with the European Resuscitation Council (ERC) Guidelines for Resuscitation 2010. The aim of the study is to assess the skills of basic life support by nurses in terms of in-hospital cardiac arrest.

Results

Study included 50 nurses actively working in their profession. Professional profile and demographic data are presented in table I.

The result obtained among the examined during the assessment of rescue procedure regarding restoration of airway patency is satisfying. A great majority of the examined performed that procedure properly in time of ten seconds, with the head tilt and chin lift, however, in single cases restoration of airway patency was not obtained table II.

The analysis of the chest compression skills revealed that a substantial number of the examined properly determined the place of chest compression, however the rate and depth of compressions were unsatisfactory table III.

Table I. Professional profile and demographic distribution of the sample group

Sex	Number of the examined (%)
Women	50 (100%)
Men	0 (0%)
Age	Number of the examined (%)
< 30	1 (2%)
31-40	22 (44%)
41-50	24 (48%)
> 50	3 (6%)
Professional profile	Number of the examined (%)
Internal Ward	10 (20%)
Specialised Outpatient Clinics	8 (16%)
Neurological Ward	5 (10%)
Paediatric Ward	4 (8%)
Health Care Centre	4 (8%)
Surgical Ward, Operating Theatre	4 (8%)
Primary Care	3 (6%)
Infectious Disease Ward	3 (6%)
Other	9 (18%)
Completed resuscitation trainings	Number of the examined nurses participating in trainings
None	0 (0%)
Work Experience (average)	18,96 (year)

Table II. Skills in proper restoration of airways patency

Obtaining airway patency in BLS	Number of the examined (%)
Total restoration of airway patency	36 (72%)
Establishing partial airway patency	5 (10%)
Failure to establish airway patency	9 (18%)

While assessing knowledge of particular elements of the adult CPR algorithm, following the ERC Guidelines 2010, with single choice test it may be stated that a great majority of the examined know the principles of ensuring personal safety and start resuscitation with a chest compression sequence. Insufficient number of participants remembers about calling specialised emergency medical services Table IV.

Discussion

Having analysed the level of knowledge of resuscitation among the sample group of nurses, it may be stated that their skills are at a low level. Having regard to the literary sources reporting on the high mortality rate due to SCA [2], it may be stated that the level of knowledge and skills in resuscitation among nurses can be expected to be high. Researchers who have addressed the problem of knowledge of resuscitation in medical environment claim that the knowledge of resuscitation is too poor while the knowledge of guidelines is rather selective [5], which this research has confirmed. A review of literature indicates that the elements of resuscitation, such as correct chest compression or proper establishment of airway patency are paramount in administering CPR and precondition restoration of spontaneous blood circulation [6-8]. In their papers, researchers lay considerable emphasis upon adequate

Table III. Skills in proper performance of chest compression

Determination of proper place for chest compression in BLS	Number of the examined (%)
Properly selected place (at the middle of the chest)	39 (78%)
Hands placed on the chest too low	6 (12%)
Hands placed on the chest too high	5 (10%)
Rate of chest compression in BLS (min)	Number of the examined (%)
> 100/min	6 (12%)
80-100/ min	30 (60%)
≤ 80/min	14 (28%)
Depth of chest compression in BLS (cm)	Number of the examined (%)
> 5 cm	6 (12%)
4-5 cm	30 (60%)
≤ 4 cm	14 (28%)

Table IV. Assessment of knowledge of particular elements of the BLS algorithm

Ensuring personal safety of the rescuer	Number of the examined
Yes	41 (82%)
No	9 (18%)
Starting BLS algorithm with a chest compression sequence	Number of the examined
Yes	43 (86%)
No	7 (14%)
Calling specialised emergency medical services	Number of the examined
Immediately after recognition of breath arrest	11 (22%)
During performance of resuscitation	5 (10%)
No call for help	34 (68%)

rate and proper depth of chest compressions and correct establishment of airway patency [8]. Having analysed the results of the conducted research, it may be asserted that proper restoration of airway patency is not a subject of concern, however, maintaining proper rate and depth of compressions raises many reservations. The information provided in professional literature depicts the importance of maintaining the structure of algorithms [9]. Compliance with the already outlined principles facilitates performance of resuscitation and improves its quality. One of the crucial elements of CPR algorithm is calling a resuscitation team. While analyzing this aspect among the sample group, it has been determined that it is often disregarded, which substantially decreases the quality of administered resuscitation and lowers the chances of survival of the affected person. In his paper, Hamilton [10] claims that in order to broaden CPR knowledge and skills, personnel should be regularly trained in resuscitation. Assessing the results of the conducted research, the foregoing thesis is justifiable.

The elements assessed in the conducted research are vital for the proper performance of CPR [2].

Conclusions

Proper execution of algorithms facilitates carrying out rescue procedures, reduces the level of stress the person doing resuscitation feels and enhances measurable effects of CPR. Having analysed the results of the conducted research, it may be stated that the knowledge and skills of nurses who have been examined are insufficient for proper performance of resuscitation in an adult. An increase in the frequency of training of medical personnel aimed at broadening CPR knowledge and practical skills requires due consideration.

Konflikt interesów / Conflict of interest

Brak/None

Correspondence address:

✉ Tomasz Ilczak
Department of Nursing and Emergency
Medical Services
Faculty of Health Sciences
Academy of Technology and Humanities
in Bielsko-Biała
2, Willowa Str.; 43-300 Bielsko Biała
☎ (+48 33) 827 91 77
✉ tilczak@ath.bielsko.pl

References

1. Sokołowska-Kozub T, Trybus-Gałuszka H, Nowak J, Koźbiał P, Drab E. Pierwsza pomoc i resuscytacja krążeniowo-oddechowa, podręcznik dla studentów. Kraków: Polska Rada Resuscytacji; 2006. str. 30-4.
2. Nolan JP, Soar J, Zideman DA, Biarent D, Bossaert LL, Deakin C, et al. European resuscitation council guidelines for resuscitation 2010. Resuscitation Section 1 Executive summary 2010;81:1219-76.
3. Rea TD, Eisenberg MS, Culley LL, Becker L. Dispatcher-assisted cardiopulmonary resuscitation and survival in cardiac arrest. Circulation 2001;104:2513-16.
4. Aldawood A. Wyniki leczenia chorych po nagłym zatrzymaniu krążenia przyjętych na oddział intensywnej terapii szpitala referencyjnego w Arabii Saudyjskiej. Pol Arch Med Wewn 2007;117(11-12):497-500.
5. Grześkowiak M, Bartkowska-Śniatkowska A, Rosada-Kurasińska J, Puklińska K. Personel medyczny szpitala pediatrycznego nie ma wystarczającej wiedzy dotyczącej prowadzenia bezprzryłkowej resuscytacji krążeniowo-oddechowej. Anaesthesiol Intensive Ther 2009;41:155-8.
6. Hwang S, Kim SH, Kim H, Jang YS, Zhao PG, Lee KH, et al. Comparison of 15:1, 15:2, and 30:2 compression-to-ventilation ratios for cardiopulmonary resuscitation in a canine model of a simulated, witnessed cardiac arrest. Acad Emerg Med 2008;15(2):187.
7. Rajab TK, Pozner CN, Conrad C, Cohn LH, Schmitto JD. Technique for chest compressions in adult CPR. World J Emerg Surg 2011;6:41.
8. Field RA, Soarb J, Daviesa RP, Akhtar N, Perkins GD. The impact of chest compression rates on quality of chest compressions – a manikin study. Resuscitation 2012;83:363-4.
9. Dyché R, Assane D, Chiang EP. Cardiac Arrest Interventions in a Prehospital Setting: Assessing the link in the “Chain of Survival”. International Journal of Business Strategy 2011;11(3):94-6.
10. Hamilton R. Nurses’ knowledge and skill retention following cardiopulmonary resuscitation, training: a review of the literature. J Advanc Nursing 2005;51(3):288-97.