

Knowledge of Advanced Cardiac Life Support among the Doctors in a Tertiary Care Hospital in Nepal

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ABSTRACT

INTRODUCTION: Medical personnel is expected to have a thorough knowledge of advanced cardiac life support (ACLS) and to have to be up to date periodically to perform this maneuver in cardiac arrest victims. The objective of this study was to access the knowledge of advanced cardiac life support of the doctors.

METHOD: This was a prospective cross-sectional observational study conducted at Bir Hospital and National Trauma Centre in specialist medical faculties to evaluate the knowledge of ACLS using pretested structured questionnaire.

RESULT: Sixty six faculty doctors from different departments were enrolled in the study. Among them, 44 were ACLS trained and 22 were untrained. We found 22.6% of doctors had good knowledge, 36.4% had average knowledge and 40.8% had poor knowledge of ACLS. Knowledge of ACLS between ACLS trained and untrained doctors was not significant ($p = 0.78$). Among the ACLS trained doctors, there was fading of knowledge with increase in time period of ACLS training ($p=0.034$).

CONCLUSION: The knowledge of ACLS among the doctors working in Bir Hospital and National Trauma Center was inadequate. Among the ACLS trained faculties, there was fading of knowledge with increase in time period of training.

KEY WORDS: Advanced Cardiac Life Support, Cardio-Pulmonary Resuscitation, Knowledge.

INTRODUCTION

Advanced cardiac life support (ACLS) is one of the most evolving areas of modern medicine which comprises a series of life saving actions that improves the survival rates of victim following cardiac arrest. Cardiopulmonary resuscitation (CPR) is performed on victims of cardiac and/or respiratory arrest to maintain flow of oxygenated blood to vital organs. Despite important advances in prevention, cardiac

arrest remains a substantial public health problem and a leading cause of death in many parts of the world. CPR skill and its application depends on the rescuer's knowledge, training, experience, and confidence. Accurate knowledge regarding ACLS for medical personal is an essential part of medical education and it should be up to date with varying protocols according to evidence¹.

Studies conducted in the past show a lack and inconsistency in knowledge regarding the CPR and defibrillation in healthcare providers.² In Nepal, there are very limited data which address the status of knowledge of ACLS of the medical personnel. This study aimed to evaluate the status of ACLS knowledge among the specialist doctors of Bir Hospital and National Trauma Center, Nepal.

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METHOD

This was a cross-sectional observational study conducted among specialist doctors (who had completed post-graduation) of Bir Hospital and National Trauma Center, Nepal from December 2017 to February 2018.

The structured questionnaires were used to assess their knowledge of ACLS. A questionnaire was based on the ACLS guidelines given by American Heart Association (AHA) 2015. For the validity, the prepared questionnaire was assessed by carrying out a pilot study among the experienced medical doctors, and the necessary corrections were made accordingly. All the participants were asked to complete the questionnaire in front of the researcher. The incomplete questionnaires were excluded. The knowledge of ACLS among the doctors was evaluated by percentage of correct answers as described in Table 1.

Table 1: knowledge assessment according to percentage of correct answers

Poor knowledge	Average knowledge	Good knowledge
< 50 % correct answers	≥ 50 -69% correct answers	≥ 70% correct answers

The collected data were analyzed by using Statistical Package for Social Sciences (SPSS 19).

The knowledge of ACLS among the doctors was evaluated by descriptive (frequency) analysis. Descriptive-Crosstab (Pearson Chi-square or Fisher's Exact test) was used for comparing the knowledge score between ACLS trained and untrained, and fading of knowledge with time duration in ACLS trained faculties.

RESULT

We approached 93 doctors from different departments. Seventy seven participants had given consent for the study. They were 20 from surgery, 24 from medicine, 15 from anesthesia, 5 from dental, 6 from radiology, 4 from pathology and 3 from oncology departments. Eleven responders were excluded due to incompletely filled forms. Only 66 were included and analyzed.

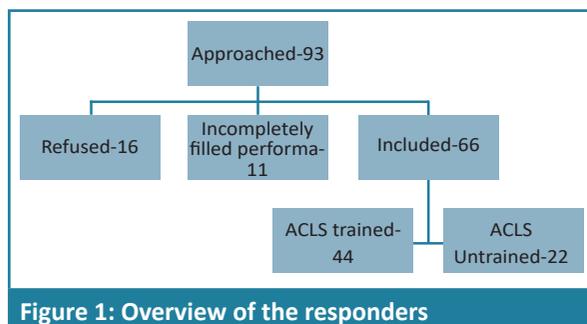


Figure 1: Overview of the responders

Knowledge assessment

We found that 22.6% of doctors had good knowledge, 36.4% had average knowledge and 40.8% had poor knowledge as shown in Figure 2.

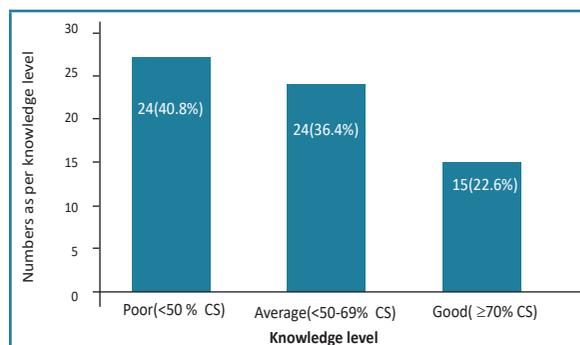


Figure 2: Knowledge assessment among doctors

Impact of ACLS training

Among ACLS trained doctors, 40.9% had poor, 34.09% had average and 25% had good knowledge of ACLS and among ACLS untrained doctors, 40.9% had poor, 40.9% had average and 18% had good knowledge ($p = 0.784$) shown in Table 2.

Table 2: Knowledge in ACLS trained vs untrained

ACLS Training	Knowledge Score			Total	p value
	Poor	Average	Good		
Yes	18	15	11	44	0.784
No	9	9	4	22	
Total	27	24	15	66	

Fading of knowledge with time duration of training

Among the ACLS trained faculties, there was fading to ACLS knowledge with increase time duration of ACLS training. ($p=0.034$).

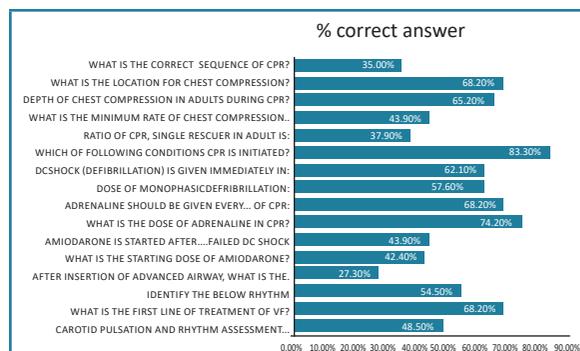


Figure 3: Percentage of correct answers of questions 2-17

Table 3: Distributions of knowledge among ACLS trained group

Duration of ACLS (Total no; 44)	Knowledge			P value
	Poor	Average	Good	
ACLS ≤3 years	2 /4.5%	2 /4.5%	6 /13%	0.034
ACLS 4-5 years	7 /15.9%	5 /11.36%	2 /4.5%	
ACLS >5 years	10 /22.72%	8 /18.18%	2 /4.5%	

DISCUSSION

Cardiac arrest is one of the leading cause of death in adult population all over the world. Return of spontaneous circulation is possible after cardiac arrest if immediate and correct steps of ACLS are followed. All the medical personnel including the doctors must have knowledge and skills to perform CPR maneuver. To retain and be up to date regarding the ACLS knowledge and skill periodic training is must.

Knowledge of ACLS

We found that 22.6% of doctors had good knowledge, 36.4% had average knowledge and majority of doctors (40.8%) had poor knowledge.

Study done by Nambiar found 51.4% responders scored 50%, 44.3% responders scored 51–80% and 4.34% responders scored >80% correct answer.³ Manikandan found 64% responders (health care professional and trainer) had secured less than 50% marks, 20% of responder secured 50-70% marks and only 16% of responder scored more than 70% marks in basic life support awareness questionnaire.⁴ Chandrasekaran found that 84.82% responder had secured less than 50% marks, 14% responder scored between 50-70% and only 1.14% responders scored more than 70%.⁵

Contrasting result to our study, Ralapanawa found that the poor knowledge (<50%) in 12.7% of responders, average (50–69%) in 44.3% of responders and good (≥70%) in 43.1% of responders.⁶ Better knowledge score might be due to high number of medical resident doctors were enrolled in this study.

Impact of ACLS training

Among ACLS trained doctors, 40.9% had poor, 34.09% had average and 25% had good knowledge of ACLS. Among ACLS untrained doctors, 40.9% had poor, 40.9% had average and 18% had good knowledge of ACLS ($p = 0.784$).

Abbas found knowledge of trained students was better than untrained students yet the mean of trained students was less than 50% which was not satisfactory.⁷ Filho found 27.2% had attended the ACLS course and had a mean score 14.9+3.0 compared 70.5% who had not attended the course and had mean 10.5+ 3.5 out of 22 questions ($p=0.0001$).⁸ Yunus found mean score for both theoretical knowledge and practice of basic life support (BLS) for trained students was higher than that of the untrained participants ($p<0.0001$).⁹

Fading of knowledge with time duration of training

Among the ACLS trained faculties, there was fading to ACLS knowledge with increased time duration of ACLS training. ($p=0.034$).

Yang did a systematic review on retention of adult advanced life support knowledge and skills in healthcare providers. This study finding suggested that ACLS knowledge and skills decayed by 6 months to 1 year after training and skills decayed faster than knowledge.¹⁰ Semeraro found significant fading of ACLS knowledge and skills in anesthesiologist in 6 months post ACLS.¹¹

The overall knowledge of ACLS among the specialist doctors of this tertiary hospital was inadequate. The ACLS knowledge even in ACLS trained doctors was not satisfactory and was fading with increase time duration of ACLS training.

LIMITATION

This questionnaire was more about extracting theoretical knowledge rather evaluating practical skills of CPR which perhaps would have been more assertive.

RECOMMENDATION

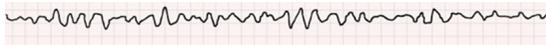
ACLS training course should be mandatory for all doctors and it should be updated yearly.

ACKNOWLEDGEMENT

We acknowledge all the doctors of Bir Hospital and National Trauma Center who participated in this study and Dr. Gaurav Ratna Bajracharya, Anesthesiologist, Bir Hospital.

APPENDIX

Questionnaire

- Have you ever done ACLS training?
NO Yes (.....years ago)
- What is the correct sequence of CPR?
a. A-B-C b. B-A-C **c. C-A-B** d. C-B-A
- What is the location for chest compression?
a. Left side of the chest b. Right side of the chest
c. Upper 1/3rd of sternum
d. Lower 1/3rd of sternum
- Depth of chest compression in adults during CPR:
a. 4 cm **b. 5 cm** c. 7 cm d. 8cm
- What is the minimum rate of chest compression in adult during CPR?
a.100 / min b.120 / min c.80 / min d. 70 / min
- Ratio of CPR, single rescuer in adult is:
a.15:2 b. 5:1 **c.30:2** d.15:1
- In which of following conditions CPR is initiated?
a. **VF, pulse less VT, pulse less electrical activity, Asystole**
b. VT with pulse, uncontrolled AF, septic shock, VF
c. Sinus tachycardia, VT with pulse, biphasic block, pulse less VT
d. SVT, WPW syndrome, 3rd degree heart block, asystole
- DC shock (defibrillation) is given immediately in:
a. **VF, pulse less VT**
b. SVT, 3rd degree heart block
c. Asystole, pulse less electric activity
d. AF, sick sinus syndrome
- Dose of monophasic defibrillation is:
a. 260 J **b. 360 J** c. 380 J d. 300 J
- Adrenaline should be given every..... of CPR:
a.1-2 min **b. 3-5 min** c. 5-7 min d. 7-9 min
- What is the dose of Adrenaline in CPR?
a. 1mg b. 2mg c.3mg d.4mg
- Amiodarone is started after failed DC shock.
a.1 b.2 **c.3** d. 4
- What is the starting dose of Amiodarone?
a.150mg b.250mg **c.300mg** d.450mg
- After insertion of advanced airway, what is the rate of ventilation?
a.8 /min **b.10/min** c.12/min d.14/min
- Identify the below rhythm:

a. VT b.SVT **c. VF** d.AF
- What is the first line of treatment of VF?
a. Adrenaline b. Amiodarone
c. DC shock d. Chest compression
- Carotid pulsation and rhythm assessment should be done in every:
a. 1min **b.2min** c.3min d.4min

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