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DETERMINATION OF ADVANCED LIFE SUPPORT KNOWLEDGE LEVEL OF RESIDENTS IN A TURKISH UNIVERSITY HOSPITAL

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□ **Abstract—The aim of the study was to determine the advanced cardiac life support (ACLS) knowledge level of residents and related factors in the departments of Anesthesiology, Emergency Medicine, Internal Medicine, and Cardiology in a university hospital. For this cross-sectional study, a total of 20 multiple-choice questions were prepared concerning several different topics, including: fatal dysrhythmias, oxygenation, ventilation and airway control, asystole, and pulseless electrical activity. Questions were given to residents before their periodic training meetings and collected in 30 min. There were 101 of 120 residents from four clinical departments (participation rate 84%) tested. Average point total and standard deviations of all residents were 66.3 ± 17 out of 100 points. On a departmental basis, statistically significant differences were found in the knowledge level of residents (Emergency Medicine: 86.2 ± 8.2, Cardiology: 66.7 ± 12.9, Anesthesiology: 59.3 ± 16.2, Internal Medicine: 56.1 ± 13.5, F: 28.6, $p < 0.0001$). The factors that affect ACLS knowledge level of residents were "postgraduate ACLS training," "awareness of guidelines," and "resuscitation frequency." Postgraduate training and the frequency of ACLS practice seem to increase the ACLS knowledge level of residents. The present study emphasizes the necessity for a standardized systematic postgraduate ACLS training program for the residents of related medical disciplines. Further studies with larger groups are needed to investigate theoretical knowledge, resuscitation skill competency, and related factors. © 2008 Elsevier Inc.**

□ **Keywords—advanced cardiac life support (ACLS); training; emergency medicine; cardiopulmonary resuscitation (CPR); advanced life support (ALS)**

INTRODUCTION

Cardiopulmonary resuscitation (CPR) was initiated in 1950 with experiments in mouth-to-mouth respiration and closed-chest cardiac massage by Safar et al. and Elam et al. (1,2). It has been continuously developing and saving lives through Basic Life Support (BLS) and Advanced Cardiac Life Support (ACLS) (3). Studies have shown that applications of ACLS led to considerable decreases in out-of-hospital and in-hospital cardiac arrest mortality. In the literature, the ACLS courses were shown to be effective in decreasing mortality (3–6).

Turkey's population is nearly 68 million, and annual coronary mortality is 5.2 for males and 3.2 for females per thousand adults. In the 45–74-year age group, total mortality prevalence is 20.3/1000 for males and 12.9/1000 for females (highest in Europe). In the same age group, coronary heart disease-related male and female mortality prevalence, being the highest in Europe, is, respectively, 8.0/1000 and 4.7/1000 (7).

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Competent application of ACLS increases hospital discharge rates (3–6). Appropriate approach to cardiac arrest cases should be considered as an essential requirement for all physicians providing care for cardiac arrest patients.

The emphasis given to ACLS in different residency programs varies according to disciplines and medical schools in Turkey. Although ACLS training is a standardized and regular part of relevant residency programs in North America, it is delivered by several medical associations on a sporadic basis in our country. There is no standardized or systematic ACLS training program on a national scale. Currently, ACLS certification is not compulsory during nor after residency.

In Turkey, there is no study on the ACLS knowledge level of residents and related factors. Based on the determination of ACLS knowledge level and related factors, an improvement in ACLS training programs may contribute to a reduction in cardiac arrest deaths due in part to insufficient ACLS knowledge and resuscitation experience.

The purpose of the present study was to determine the ACLS knowledge level of residents and related factors in the departments of Anesthesiology, Emergency Medicine, Internal Medicine, and Cardiology at a university hospital.

METHODS

The cross-sectional study was carried out in Dokuz Eylul University Hospital, Izmir, Turkey. Due to the higher frequency of clinical encounters requiring ACLS, the residents of the departments of Anesthesiology, Emergency Medicine, Internal Medicine, and Cardiology were included in the study.

Inquiry Form

Based on the "*Guidelines 2000 for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care-An International Consensus on Science*", the Emergency Medicine specialists who were also the authors of the present study prepared the knowledge questions (3). The content validity of the questions was evaluated by a separate group of Emergency Medicine specialists.

Multiple choice questions were prepared concerning several different topics: 1) fatal dysrhythmias, 2) oxygenation, ventilation, and airway control, 3) asystole, and 4) pulseless electrical activity. A total of 20 questions (five questions from each topic) were prepared. The knowledge questions were prepared in Turkish. The English translations of these questions are shown in the Appendix. Each correct answer was attributed five points and the total added up to 100 points.

The questions included in the first section were; age, gender, department name, total duration of medical practice and residency, undergraduate or postgraduate ACLS training, time elapsed since ACLS training, monthly resuscitation frequency, awareness about the *International Consensus Guidelines 2000*, and residents' self-appraisal of ACLS knowledge proficiency level. The second section of the examination form consisted of 20 multiple choice questions. The test was given to residents before their periodic training sessions and collected in 30 min.

Data Analysis

SPSS-11.0 software (SPSS Inc., Chicago, IL) was used for statistical evaluation of the data. Chi-square, independent sample *t*-test, and one-way analysis of variance were used for statistical analysis.

RESULTS

Descriptive Findings

The participation rate was 84% (101 residents out of 120). The residents who refused to participate and who were absent during the data collection time were excluded from the study. The participating residents were as follows: 30 residents from the Anesthesiology Department (participation rate 75%), 26 residents from the Emergency Medicine Department (participation rate 96%), 31 residents from the Internal Medicine Department (participation rate 86%), and 14 residents from the Cardiology Department (participation rate 78%).

Fifty-three residents (53%) were female and 48 residents (47%) were male. Mean age was 27.8 $\pm$ 2.3 years. Average duration of medical practice was 42.9 $\pm$ 25.5 months, and average duration for residency was 27.6 $\pm$ 14.6 months. There were 55 (54.5%) junior residents ($<$ 24 months) and 46 (45.5%) senior residents ($\geq$ 24 months).

The number of residents who received undergraduate and postgraduate ACLS training were 38 (37.6%), and 50 (49.5%), respectively. Twenty-four (23.8%) residents had both undergraduate and postgraduate training.

The percentages of residents who received postgraduate ACLS training according to their departments were as follows; Anesthesiology 76.7%, Emergency Medicine 84.6%, Internal Medicine 9.7%, and Cardiology 14.3%. When analyzed on seniority basis, the percentages of junior and senior residents who received postgraduate

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