

Geriatric patient profile in the cardiovascular surgery intensive care unit

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Abstract

Objectives: To determine hospitalization durations and mortalities of elderly in the Cardiovascular Surgery Intensive Care Unit.

Methods: The retrospective study was conducted in a Cardiovascular Surgery Intensive Care Unit in Turkey and comprised patient records from January 1 to December 31, 2011. Computerized epicrisis reports of 255, who had undergone a cardiac surgery were collected. The patients were grouped according to their ages, Group I aged 65-74 and Group II aged 75 and older. European society for Cardiac Operative Risk Evaluation scores of the two groups were compared using SPSS 17.

Results: Overall, there were 80 (31.37%) females and 175 (68.62%) males. There were 138 (54.1%) patients in Group I and 117 (45.9%) in Group II. Regarding their hospitalization reasons, it was determined that 70 (27.5%) patients in Group I and 79 (30.9%) patients in Group II were treated with the diagnosis of coronary artery disease. The average hospitalization duration of patients in the intensive care unit was determined to be 11.57 ± 10.40 days. Regarding the EuroSCORE score intervals of patients, 132 (51.8%) had 3-5 and 225 (88.2%) patients were transferred to the Cardiovascular Surgery and then all of them were discharged; 5 (4.1%) had a mortal course; and 11 (7.7%) were transferred to the anaesthesia intensive care unit

Conclusions: The general mortality rates are very low in the Cardiovascular Surgery Intensive Care Unit and the patients have a good prognosis.

Keywords: Geriatric patient, Profile, Cardiovascular surgery intensive care unit, Mortality. (JPMA 63: 1338; 2013)

Introduction

The rate of the elderly population in the society increases with each passing day in the World, including Turkey.¹ This increase means increase in material, moral, social health problems.² According to the results of the address-based population census that was performed by the Turkish Statistical Institute in 2008; 4.893.423 (6.84%) of the total population of 71.517.000 consisted of individuals aged 65 and older.³

In Europe and the United States, together with the increase of the elderly population in the general population, the rate of elder patients in the intensive care units (ICU) increases as well.³ In general, it is indicated that an important part of patients who are hospitalized in adult ICUs consist of aged patients, and that approximately 60% of patients in the United States are 65 and older.⁴ Together with the increase of the elderly population, the rate of elder patients who are required to be hospitalized in ICUs has increased in Turkey as well.^{3,5}

ICUs are special treatment units with high technological equipment that are developed for the follow-up and

treatment of organ failures, seen in the course of both acute and chronic diseases and life threatening situations and require a close observation and immediate action.⁶ Elder patients generally comprise a privileged patient group in ICUs, due to the acute inflammation of their underlying chronic health problems or problems that are related with various organ systems.^{5,7,8}

Cardiovascular diseases have an important place among diseases that increase with aging. Owing to the technological developments in cardiovascular surgery, the rate of elderly patients to be treated with surgery has gradually increased over the last 10 years and by this way, survival rates and life qualities of patients increase and important cardiac side effects are prevented.⁹⁻¹² However, cardiac surgery is thought to be an important stressor for elder patients and increases the personal sensitivity.¹² Thus, it is important to determine the profile of elder patients, especially the causes of mortality in the cardiovascular surgery ICU.

This study was performed in an attempt to determine the features, hospitalization durations and mortalities of elderly population aged 65 and older, who were admitted to Cardiovascular Surgery ICU, and the factors that influence mortality.

The hypothesis had four elements:

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Elderly patients who had undergone a cardiac surgery have a high mortality rate;

There is a relation between age groups and hospitalization durations;

There is a relation between age groups and mortality rates; and

There is a relation between diagnoses of patients and their European Society for Cardiac Operative Risk Evaluation (EuroSCORE) scores.

Patients and Methods

The retrospective study comprised files of elder patients in the Cardiovascular Surgery Intensive Care Unit in Izmir, Turkey, between January 1 and December 31, 2011. Then sample size was based on all patients meeting the basic criterion. The patients were grouped according to their ages as Group I aged 65-74 and Group II aged 75 and older. This was done to see if mortality rates change as has been reported in literature.¹² Age, gender, diagnosis, duration of ICU stay, EuroSCORE value averages, survival rates after beyond the ICU and mortality rates were recorded for each individual. The EuroSCORE system was used to determine the mortality and morbidity in the patient. The groups that are determined using the EuroSCORE system is classified as: low risk group (score 0-2); median-risk group (score 3-5) and high-risk group (score >5).¹

Written permissions were obtained from the hospital and the patients/families.

For statistical purposes, SPSS 17 was used.

All data was categorical except hospitalisation duration which was taken as a continuous variable. Frequencies and percentages analysis was worked out for categorical variables, the mean \pm standard deviation (SD) was calculated for the continuous variable. Since the distribution of hospitalization duration, did not comply with the normal distribution, Mann-Whitney U test was used. Chi square was used for the comparison of age groups according to their gender, diagnosis, reason of departure and EuroSCORE. Kruskal-Wallis test, was used for the comparison of age groups according to their gender-hospitalization duration, mortality rate and EuroSCORE values. Qualitative data were assessed at a confidence interval (CI) of 95%; while $p < 0.05$ was considered significant.

Results

Of the total 255 patients, 175 (68.2%) were males and 80 (31.37%) were females. The average age of the patients

Table-1: Distribution of patients according to their definitive features.

Definitive Features	Groups (N=255)			
	Group I		Group II	
Gender	n	%	n	%
Female	41	29.7	39	33.3
Male	97	70.3	78	66.7
	$\chi^2=0.38$	$p=0.53>0.05$		
EuroSCORE Values	n	%	n	%
0-2	27	19.6	18	15.4
3-5	75	54.3	57	48.7
5 and above	36	26.1	42	35.9
	$\chi^2=3.00$	$p=0.22>0.05$		
Reason for Leaving	n	%	n	%
Exitus	-	-	5	4.1
Transfer	8	5.8	3	1.9
Discharge	130	94.2	110	94.0
	$\chi^2=3.36$	$p=0.18>0.05$		
Total	138	100	117	100

Table-2: Results of groups according to their hospitalization period averages.

Groups	N	X	SS	p
Group I	138	11.85	11.02	0.909
Group II	117	11.24	9.65	

Table-3: The relation of patients' diagnoses and EuroSCORE values.

Diagnosis	EuroSCORE Scores		
	0-2 Points %	3-5 Points %	5 Points and above %
Coronary Artery Disease	11.2	17.8	29.4
Aneurysm	4.8	9.3	2.4
Peripheral Artery Disease	3.7	2.3	6.2
Emboli	1.7	4.3	2.2
Myocardial Infarction	1.7	2.3	0.7
	$\chi^2=59.49$	$df=30$	$p=0.001<0.05$

was 74.16 ± 6.33 years; 138 (54.1%) were in the age group of 65-74, 117 (45.9%) were in the age group of 75 and older. Besides 118 (46.3%) patients were supported by mechanical ventilation. Overall 225 (88.2%) patients were transferred to the Cardiovascular Surgery ICU and all of them were later discharged; 11 (7.7%) were transferred to the anaesthesia ICU (Table-1). The mean hospitalisation duration in the ICU was 11.57 ± 10.40 days; 11.85 ± 11.02 days for Group I, and 11.24 ± 9.65 days for Group II. The relation between age groups and hospitalisation duration of patients was not found to be statistically significant (Table-2).

Regarding hospitalisation reasons, 70 (27.5%) patients in Group I and 79 (30.9%) patients in Group II were treated for

coronary artery disease. Regarding ICU hospitalisation 42 (16.5%) patients had aneurysm, 31 (12.2%) had peripheral artery disease, 21 (8.2%) had emboli and 12 (4.7%) had myocardial infarction and underwent cardiac surgery. Regarding the EuroSCORE value intervals of patients, 132 (51.8%) had 3-5, 78 (30.6%) had 5 points and above; and 45 (17.6%) had 0-2 points. In Group I, 75 (54.3%) patients and in Group II 57 (48.7%) patients had a EuroSCORE value of 3-5 points. A statistically significant difference was identified between the EuroSCORE values and diagnoses ($p < 0.05$). It was observed that the EuroSCORE values of patients treated for coronary artery disease were higher, and they were involved in the median and high-risk group in terms of mortality (Table-3).

Overall 5 (4.1%) had a mortal course; and all of them were from Group II. Of those who were transferred to the anaesthesia ICU, 8 (5.8%) were from Group I, and 3 (1.9%) were from Group II. Comparing the distribution of patients according to their age groups and ICU mortality rates, the difference between them was not statistically significant ($p > 0.05$). No statistically significant relation was found between the age, gender, diagnosis, ICU hospitalisation duration and EuroSCORE values of patients and their mortality ($p > 0.05$). No statistically significant difference was found between the EuroSCORE values, ICU hospitalisation durations and mortality rates of Group I and Group II patients ($p > 0.05$). Comparing the age groups according to their gender-hospitalization duration, mortality rate and EuroSCORE scores, the difference between genders was not found to be statistically significant ($p > 0.05$).

Discussion

Aging is marked by decrease in cardiopulmonary and renal reserves, high-speed comorbidity and high rates of mortality.³ Leung and Dzankic reported that one or more negative outcomes could be observed in elderly patients who had undergone a surgical operation at a rate of 21% during the post-operative period, especially due to cardiovascular, neurological or pulmonary system.¹³ ICUs are units with a high mortality. In a study, young patients were compared with patients aged 65 and older in medical and surgical ICUs, and it was reported that mortality increases together with aging. Besides, the same study determined that mortality increases two times more in the group of 75 and above, compared to the group of 65 and younger.¹⁴ Somme et al examined the mortality speeds of 410 patients aged 75 and older in medical ICUs and reported that the speed was 45.9% in 85 patients who were hospitalised for less than 2 days, and it was 24.6% in 325 patients who were hospitalised for more than 2 days.¹⁵ In the study performed on 432 intensive

care patients who were 60 and older, Grace and colleagues (2007) determined the mortality rate as 37% in the age group of 60-70; 50% in the age group of 70-80; 61% in the age group of 80-90; and 83% in the age group of 90 and older.¹⁶

There have been few studies in literature, that examined the post-operative mortality rates of the elderly who had undergone a cardiac surgery. These results assert that mortality rates are not high in the elderly population following cardiac surgery, but, mortality increases together with aging. Our study also found that the patients had a low mortality rate. In their retrospective study, Kolh et al determined the mortality rate to be 13% in the elderly who were 80 and older following cardiac surgery.¹⁷ A similar study determined that mortality varied between 3.3% and 5.7% in two groups who had undergone different cardiac surgical operations.¹⁸ In their study which separated the patients who had undergone a cardiac surgery into two age groups and examined their mortality rates, Avery et al found that while the mortality was 3.4% in 65-75 age group, it was 13.5% in the age group of 80 and older.¹⁹ In their study on an elderly patient group having undergone open heart surgery, Okutan et al determined the mortality rate of patients to be 2.51%.¹ Examining the mortality rate in the elderly population aged 80 and older, having undergone cardiac surgery according to the type of the surgical operation, Alexander et al determined that mortality rates varied respectively between 4.2% and 18.2%.⁹ These results support the mortality results of our study. Besides, all of the exitus cases in our study occurred on Group II patients who were 75 and older. This result is in line with literature and that says mortality rate is higher in the elderly aged 75 and older, in ICUs.¹²

The mortality rates of elder patients are higher compared to the same age group, even after the discharge from the ICU. In a study, the mortality rates of patients aged 75-79, 80-84 and 85 and older, who were discharged after being treated in intensive care, were found respectively as 21.6%, 26.7% and 28.9% three months later. In France where the study was conducted, the three-month mortalities were indicated respectively as 0.9%, 1.6% and 3.7% in the same age groups. Excluding the patients who were lost within the first three months, the one-year data of the same study determined the mortality rate to be respectively as 14.9%, 16.9% and 19.4%; similarly, the mortality was determined as 3.6%, 6.3% and 14.8% in the same age groups in the general society.¹⁵ It is indicated in literature that mortality is encountered in the elderly, who are treated beyond the ICU, though not at very high rates. However, mortality rates are lower for the elderly having

undergone a cardiac surgery.¹² It was determined in our study that all of the patients who were treated following the ICU were discharged. This result is thought to be associated with the fact that the age average of our patients is below 75 and a great majority of them are in the age group of 65-74. Literature emphasises that mortality increases together with aging in elderly, who are treated beyond the ICU.¹⁵

In our study, no statistical significance was found between the distribution of patients according to EuroSCORE values and ICU mortality rates. Iokutan et al also indicated that they determined no significant relation between the EuroSCORE value and the expected and realized mortality rates of patients who were separated as low, median and high risk groups according to their evaluation scores.¹

Conclusion

The study showed that the general mortality rates were very low in the Cardiovascular Surgery ICU and the patients had a good prognosis. The survival of the elderly population, who are treated in the ICU, increases together with a systematic and qualified team approach, as well as the sustainment of their treatments and fulfillment of their needs. Thus, it is thought to be important to plan the care service of elderly patients by considering the physiological and psychological changes caused by the cardiac surgery and having an integrated approach.

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