

Outcome of CABG in Patients Aged More Than 50 Years

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Objective: To evaluate the effect of age on the outcome of the coronary surgeries.

Setting: King Abd El Aziz University hospital, Department of medicine.

Design: Retrospective.

Method: Sixty-one patients were included in the study, aged 14 and 89 years old. Forty-four patients were more than 50 years old and 17 young patients. All the patients had Coronary artery bypass graft (CABG) from January 2009 to August 2010. Severity, risk factors, type of procedure, co-morbidities, recent myocardial infarction, unstable angina, and laboratory analysis were documented. Number of grafts, duration of stay in ICU, measurements of risk factors of MI, IHD, CAD, RHD and bronchial asthma were documented.

Result: Sixty-one patients were included in the study, 52 males and 9 females; 7 Saudi and 54 were non-Saudi patients. The mean age was 54 ± 1.64 years (range 14-89). The patients were divided to two groups: group 1, above 50 years and consisted of 44 patients, 38 males and 6 females, a mean age of 60 ± 1.03 years; group 2, 50 years or less consisted of 17 patients, 14 males and 3 females, a mean age of 14 ± 2.82 years.

Significant difference in the number of grafts between the elderly and young patients was found. No significant statistical differences between the two groups in ICU duration and the mortality rate were found. Highly significant statistical differences were detected in MI and RHD in both groups.

Conclusion: Cardiac surgery has a higher risk factor for the elderly. It has been stated that CABG affects elderly and young patients differently, especially the number of grafts and the risk factors.

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According to the American Heart Association, 427,000 coronary artery bypass graft (CABG) surgeries were performed in the United States yearly, making it one of the most common major operations¹. CABG surgery is advised for selected groups of patients with significant narrowing and blockages of the coronary arteries. CABG surgery creates new routes around narrowed and blocked arteries, allowing sufficient blood

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flow to deliver oxygen and nutrients to the heart muscle². The elderly population of the Saudi Arabia is increasing and correspondingly the number of older people admitted to CABG surgery. The elderly patients tend to have more severe coronary disease than the young and have a worse outcome³⁻⁵.

Cardiovascular disease is a leading cause of morbidity and mortality in older people, and increasingly, elderly patients are referred for revascularization. The majority of previous studies in elderly patients undergoing percutaneous coronary intervention (PCI) and coronary artery bypass grafting (CABG) surgery have reported less successful revascularization and more adverse outcomes⁶⁻⁸. Recently, improved outcomes have been reported⁹. However, these observations have led to question the value of aggressive revascularization in elderly patients¹⁰.

The aim of the study is to evaluate the age factor on the outcome of the coronary surgery in number of grafts, ICU duration, mortality rate and risk factors.

METHOD

Sixty-one patients who had CABG surgery were reviewed. The first group was 44 patients, 38 males and 6 females; the mean age was 60.3 ± 1.03 years (51-89, more than 50 years). The second group was 17 young patients, 14 males and 3 females, the mean age of 38.8 ± 2.8 years (14-50; 50 years or less).

The number of grafts, duration of stay in ICU, measurements of risk factors of MI, IHD, CAD, RHD and bronchial asthma were documented.

Data entry and analysis were done using SPSS, Version 19. A written informed consent was taken from every patient included in the study.

RESULT

The included 61 patients; 54 were non-Saudis and 7 Saudis. The patients were divided to two groups: The first group had 44 patients, more than 50 years, 38 males and 6 females; the mean age was 60.3 ± 1.03 years (51-89). The second group had 17 patients, 50 years or less, 14 males and 3 females, the mean age was 38.8 ± 2.82 years old (14-50), see table 1.

Table 1: Personal Characteristics

Personal Characteristics		Over all		50 years or less		More than 50 years	
				Number and percentage			
	Total	61		17		44	
Sex	Male	52	85%	14	82%	38	86%
	Female	9	15%	3	18%	6	14%
Nationality	Saudi	7	11%	3	18%	4	9%
	Non Saudi	54	89%	14	82%	40	91%
Age group	50 years or less	17	28%	17	100%	0	0%
	More than 50 years	44	72%	0	0%	44	100%
	Average	54.3		38.8		60.3	
	Minimum	14		14		51	
Age range	Maximum	89		50		89	
	St D	12.80		11.61		6.84	
	St Er	1.64		2.82		1.03	

Sixty-one percent of the first group had 3 grafts or more, while 29%, of the second group, had less than 3 grafts, which is statistically significant difference, see figure 1. *P value*=0.025. Twenty-four (55%) patients

of the first group stayed less than 3 days in ICU, while nine (53%) of the second group stayed more than 3 days, which is statistically not significant, see figure 2.

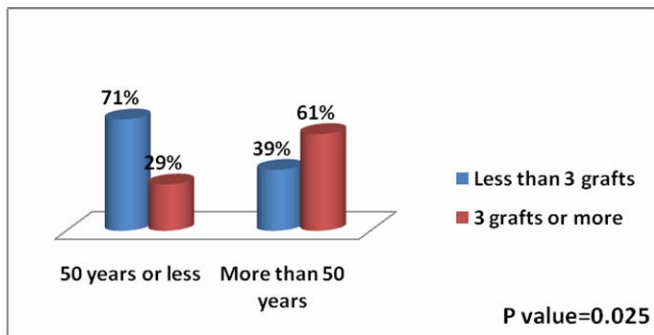


Figure 1: The Number of Grafts

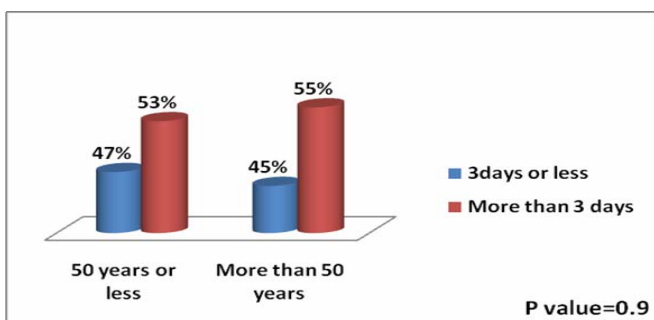


Figure 2: ICU Duration

Blood pressure and blood glucose levels were measured, 15 (34%) patients in the first group had hypertension while in the second group were 6 (35%) patients. Nineteen (43%) patients in the first group and only 5 (29%) of the second group had diabetes mellitus (DM), see figure 3. Two (5%) patients in the first group died, see figure 4.

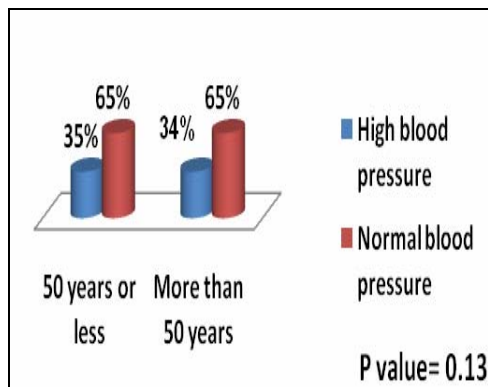


Figure 3(A)

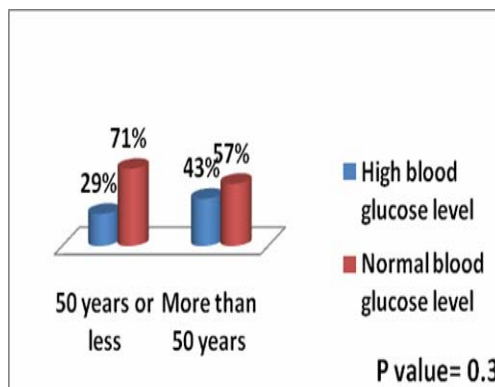


Figure 3(B)

Figure 3 (A, B): Incidence of Hypertension and DM

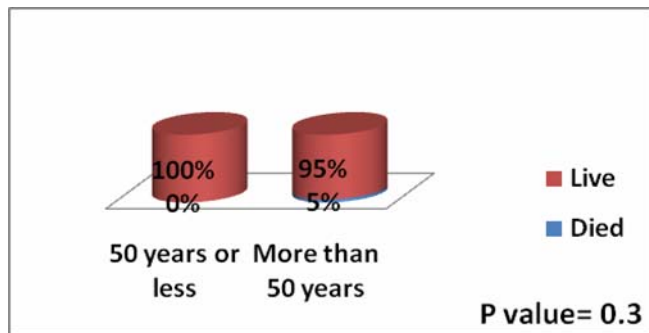


Figure 4: Mortality Rate

Significant difference in Rheumatic Heart Disease and Myocardial Infarction was found, P value=0.001 & 0.004; also statistically significant difference was seen in Acute Chest Syndrome P value=0.021. No statistical significance was found in CVA, CAD, Bronchial Asthma and IHD, see table 2.

Table 2: Incidence of CVA, RHD, IHD, ACS, CAD, MI, BA

		Over all		50 years or less		More than 50 years	
		Number	percentage	Number	percentage	Number	percentage
CVA (Cerebrovascular Accident or Stroke)	Yes	1	2%	0	0%	1	2%
	No	60	98%	17	100%	43	98%
RHD (Rheumatic Heart Disease)	Yes	4	7%	4	24%	0	0%
	No	57	93%	13	76%	44	100%
IHD (Ischemic Heart Disease)	Yes	33	54%	8	47%	25	57%
	No	28	46%	9	53%	19	43%
ACS (Acute Chest Syndrome)	Yes	2	3%	2	12%	0	0%
	No	59	97%	15	88%	44	100%
CAD (Coronary Artery Disease)	Yes	1	2%	0	0%	1	2%
	No	60	98%	17	100%	43	98%
Myocardial Infarction	Yes	3	5%	3	18%	0	0%
	No	58	95%	14	82%	44	100%
Bronchial Asthma	Yes	1	2%	0	0%	1	2%
	No	60	98%	17	100%	43	98%

The Hemoglobin measured at admission and at discharge was 9.47, 9.67 in the first group and 8.51, 8.85 in the second group. WBC measured at admission and at discharge was 11.87, 11.31 in the first group and 14.06, 12.25 in the second group. Finally, creatinine measured at admission and at discharge was 91.57, 96.60 in the first group and 107.24, 100.24 in the second group, see table 3.

Table 3: Hemoglobin (HB), White Blood Cells (WBC) and Creatinine at Admission and Discharge

		Over all	50 years or less	More than 50 years
Hb at admission	Average	9.19	8.51	9.47
	Range	6.1-14.2	6.9-10.7	6.1-14.2
	St D	1.69	0.98	1.85
	St Er	0.22	0.24	0.28
Hb at discharge	Average	9.50	8.85	9.76
	Range	7.1	7.1-10.1	7.2-12.4
	St D	1.14	1.00	1.09
	St Er	0.15	0.24	0.17
WBC at admission	Average	12.50	14.06	11.87
	Range	6.3-31.1	7.5-31.1	6.3-21.5
	St D	4.62	5.46	4.15
	St Er	0.60	1.32	0.64
WBC at discharge	Average	11.58	12.25	11.31
	Range	5-21.2	5-20.3	5.3-21.2
	St D	3.76	4.41	3.49
	St Er	0.49	1.07	0.54
Creatinine at admission	Average	96.08	107.24	91.57
	Range	41-349	41-349	58-129
	St D	40.54	70.09	18.31
	St Er	5.28	17.00	2.82
Creatinine at discharge	Average	97.64	100.24	96.60
	Range	46-383	46-383	53-296
	St Er	7.05	18.79	6.55

DISCUSSION

This study has shown that CABG surgery for elderly and young patients are significantly different in terms of number of grafts, incidence of myocardial infarction, acute chest syndrome and rheumatic heart disease¹¹. In this study, twenty-seven (44%) patients of the elderly and 5 (8.19%) of the younger groups needed 3 grafts or more.

In this study, three (5%) patients of the younger group had myocardial infarctions, while no one in the elderly group. Four (7%) patients of the younger group had rheumatic heart disease, but no one in the elderly group. There was a significant difference between both groups in acute chest syndrome. No significant difference between both groups in mortality rate, stroke, IHD, bronchial asthma and CAD was seen. Two elderly patients died while none in the younger group, Al-Ruzzeh et al study showed that the elderly are a challenging group of patients increasingly presenting to cardiac surgeons¹². These patients have diminished functional reserves and are more likely to have preoperative co-morbid conditions. Although the advances in cardio pulmonary bypass, myocardial protection and critical care have improved the outcome in this group, morbidity and mortality rates stayed significantly higher than that of younger age groups¹²⁻¹⁴.

Our result is similar to Alexander et al study which showed that the major clinical predictors of mortality

were largely the same in elderly as in younger patients¹¹. In addition, while the relationship between age and in-hospital mortality appears to be nearly linear, the gap between mortality in the young and old after CABG is smaller than previously thought¹¹.

Our result is similar to Horneffer et al study, in which the mortality rates were similar in elder and younger groups after discharge¹³. While patient age at operation significantly influenced hospital mortality and morbidity, this appeared to be a consequence of the greater frequency of risk factors in patients over 70 years of age.

Rumsfeld et al showed that younger patients had a higher prevalence of previous cardiac operation, previous myocardial infarction, and diabetes. In our study, the younger patients had a higher prevalence of myocardial infarction, acute chest syndrome but the elderly group had a higher prevalence in diabetes, IHD, BA and mortality rate^{15,16}.

The results of Rumsfeld et al showed that the relationship between age and in-hospital mortality appears to be nearly linear, the gap between the mortality in the young and elderly people after the CABG surgery is smaller than previously¹⁶. In our study, there is no significant difference in the mortality rate between elderly and younger patients.

CONCLUSION

Cardiac surgery has a higher risk in the elderly, but now is safer than before. It has been suggested that coronary artery bypass graft (CABG) affect elderly and young patients differently, especially in the number of grafts, risk factors (MI, RHD and ACS), but no difference in mortality rate or ICU duration.

Advanced age alone should not be a deterrent for coronary artery bypass surgery, as long as it has been determined that the benefits outweigh the potential risk.

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