

## Original Article

### Coronary artery bypass grafting in elderly Saudi patients

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#### Abstract

##### Background

The mean age for patients undergoing coronary artery bypass grafting (CABG) and other cardiac surgery procedures is increasing. Our patient population in Saudi Arabia differs in important respects from populations reported in western medical literature, for example, there is high incidence of diabetes mellitus and the more sedentary lifestyle. In this study we intend to evaluate the outcome of CABG in Saudi patients aged seventy years and above, to obtain grounds for patients' counseling and surgical decision making.

##### Patients and Methods

The perioperative data of 189 patients aged seventy years and above who underwent isolated CABG in the period from January 1999 to December 2005 were retrospectively evaluated and compared to those who were

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below seventy. Patients having additional valve procedure were examined separately to determine the impact of this combination on the surgical risk.

##### Results

There were 189 patients aged seventy and above (14%) out of a total of 1400 patients who underwent isolated CABG. The in hospital mortality of this group was 14 deaths (7.4%). In the group aged less than 70 years the mortality was 2.3 % (p-value=0.02). Thirty nine patients aged 70 and over underwent an associated valve procedure and the in hospital mortality in this group was 12 deaths (30.8%) compared with 4% in the younger age group.

Elderly females who underwent a combined CABG and valve surgery had a 46.5% in hospital mortality (Odd ratio= 2.1, and 95% CI=1.2 -4.1).

##### Conclusion

Elderly Saudi patients have a high mortality when they undergo a combined CABG and valve procedure. Female gender significantly affects the mortality in these patients.

##### Introduction

The increasing numbers of elderly patients and the growing advances in surgical revascularization techniques have encouraged western physicians to include more of these elderly patients in surgical revascularization list<sup>(1, 2)</sup>. There is a good amount of published literature that guides cardiac surgeons in the western countries

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when they endeavor surgery in an elderly patient. Recognizing the differences in populations, our Saudi patients differ in many respects from those published in western reports. There is a higher incidence of diabetes mellitus in Saudi Arabia<sup>(3)</sup> and as much as 62% of our patients in King Fahad Armed Forces Hospital have diabetes mellitus.

To find out population specific numbers that can guide our decision making and counseling of elderly patients, we retrospectively reviewed our elderly population (>70 years) who underwent coronary artery bypass grafting (CABG).

#### **Patients and Methods**

Between January 1999 and December 2005, all patients aged 70 years and above who underwent isolated coronary artery bypass grafting, were retrospectively evaluated. They were compared to those who were below 70. Patients who underwent an associated valve procedure were separately examined to assess the impact of this combination on the surgical risk. The data of interest included the patient age, gender, the presence of co-morbidities like diabetes mellitus and hypertension. The operative data included type of CABG (on pump or off pump), ischemia time, bypass time, and the use of internal mammary artery (IMA). The Parsonnet score<sup>(4)</sup> was used for all patients to stratify the risk.

#### **Operative techniques**

Surgical techniques included a standard median sternotomy after induction and maintenance of general anesthesia with fentanyl and diprivan (propofol). IMA, great saphenous vein, and the radial artery were the conduits used with variable indications. For on-pump cases cardiopulmonary bypass was established with mild systemic hypothermia (32 °C). Myocardial protection

was achieved using cold, intermittent crystalloid or potassium blood cardioplegia antegradely and retrogradely. Construction of distal anastomoses was performed first, followed by valve procedure in cases of combined procedure, and the proximal anastomoses was performed after closing the cardiac chambers, de-airing and cross clamp removal. A side clamp was used for proximal anastomoses. Pharmacological or mechanical support was provided to the patient as required. For off pump cases, suction device was used to stabilize the area of distal anastomoses. All patients were admitted to the coronary care unit (CCU) postoperatively.

#### **Statistical analysis**

All data was transferred to SPSS version 12. Continuous variables were expressed as mean  $\pm$  standard deviation (SD) in the tables and text, and categorical variables are reported as percentages. The unpaired t test and  $\chi^2$  or Fisher's exact test for continuous and categorical data respectively. Statistical significance was defined by a p value less than 0.05.

#### **Target outcome**

The primary end points were the in hospital mortality of the elderly group compared with the younger cohort, the effect of combined CABG and valve on elderly patients mortality and the effect of gender on the immediate outcome.

#### **Results**

There were 189 patients (14%) aged seventy years and above out of a total of 1400 patients who underwent isolated CABG. Fig. 1 exhibits the proportions of each age – procedure category. Table 1 reports the preoperative characteristics of both groups of patients who underwent isolated CABG; More than half of each age group

had diabetes mellitus. Elderly patients tend to have a lower left ventricular ejection fraction ( $p=0.2$ ), (Fig. 2). There were no differences between the two age groups with regard to operative characteristics (Table 2). The in hospital mortality is depicted in Table 3; more than 30% of elderly patients who had a combined CABG and valve

procedure died ( $p= 0.001$ ). The average Parsonnet score for this group was  $22.8 \pm 9$  (range 11 – 36); while for the younger cohort the average score was  $14.0 \pm 4$  (range 10 – 18). Elderly females are more likely to die than younger ones (46.5 Vs 4.3%) when they undergo a combined CABG and valve procedure ( $p = 0.0001$ ).

Figure 1

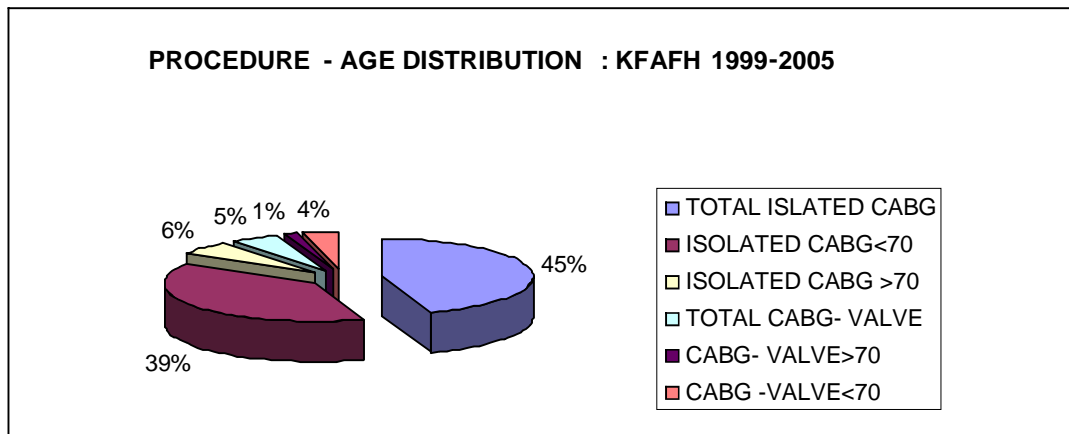
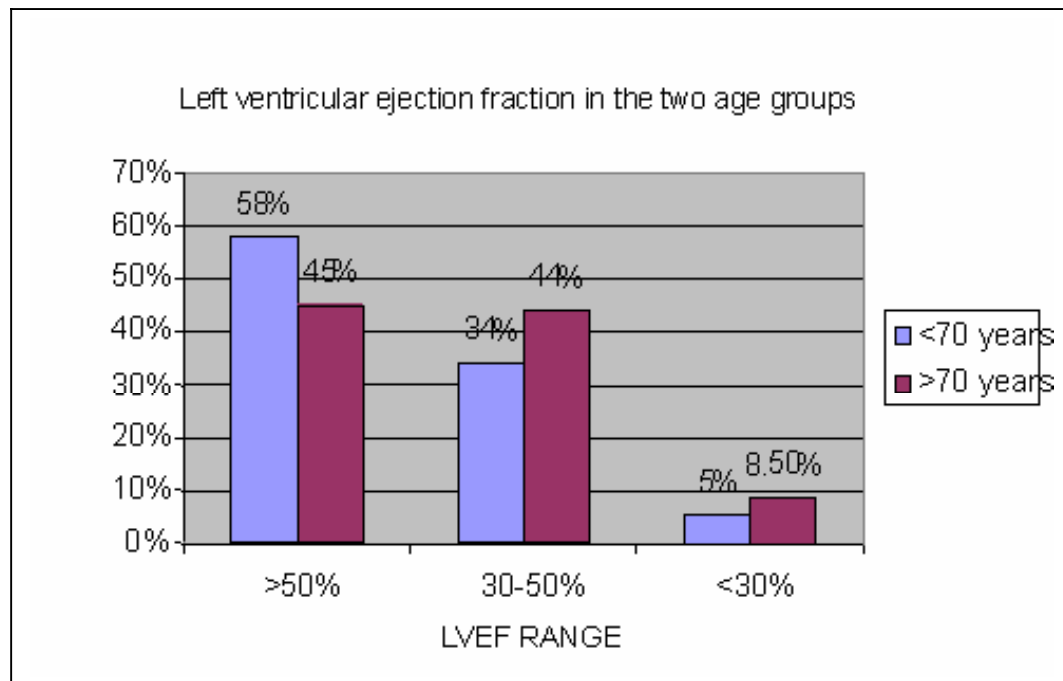


Table 1: Preoperative characteristics of patients undergoing isolated CABG

Characteristics	No.< 70 years	% < 70	No. >70 years	% > 70	p*
<b>Total</b>	1211	86.5	189	13.5	
<b>Men</b>	972	80	152	81	NS
<b>Women</b>	239	20	37	18	NS
<b>Age mean range</b>	56 23 – 69		74 70 -- 92		NS
<b>Diabetes Mellitus</b>	826	62	111	56	NS
<b>Hypertension</b>	685	51	113	57	NS

NS (Not significant) CABG (coronary artery bypass grafting)

**Figure 2**



LVEF – left ventricular ejection fraction

**Table 2**  
**Operative characteristics of patients undergoing isolated CABG**

Age group	<70	>70	P
Number of grafts	2.7	2.8	NS
Percentage of IMA used	95%	94.5%	NS
Cross clamp time (minutes)	61.8 ± 10	61.5 ± 11	NS
Bypass time (minutes)	97 ± 12	103 ± 14	NS
OPCAB Conversion rate	383(32%) 7.8%	60(32%) 3.7%	NS

NS (Not significant)

CABG (coronary artery bypass grafting)

**Table (3)**  
**In – hospital mortality\***

	No. <70 years (%)	No. > 70 years (%)	p- value
<b>Isolated CABG</b>	28 (2.3%)	14 (7.4%)	0.06
<b>Men</b>	18 (1.85%)	10 (6.6%)	0.01
<b>Women</b>	10 (4.2%)	4 (10.8 %)	0.002
<b>CABG- valve</b>	5 (4%)	12 (30.5%)	0.001

\* Numbers indicate the number of patients died.

### Discussion

The risk of coronary artery bypass grafting in elderly patients, with or without a combined valve procedure have been demonstrated by studies in different population groups<sup>(5, 6, 7)</sup>. There is little doubt that our patients in Saudi Arabia differ in important respects from populations reported in western medical literature; sixty percent of all patients presenting for coronary artery bypass at King Fahad Armed Forces Hospital, Jeddah have diabetes mellitus in contrast to much lower figures reported from western populations<sup>(6, 7, 8)</sup>. Forty percent of the Saudi population have metabolic syndrome, with a higher prevalence amongst females (42%)<sup>(9)</sup>.

There is a much higher mortality rate in this series for elderly patients who undergo a combined bypass grafting and a valve procedure compared to the published literature<sup>(6, 8)</sup>. What accounts for this is in part the high risk patients operated upon as stratified by the Passonnet score, which has shown a mortality risk proportionate to the actual mortality. Some factors particular to our population must also account for this outcome.

Female gender in the elderly age group is specifically a very significant risk factor for mortality from a combined procedure in this study. This is an important fact to bear in mind when exercising decision making in this sort of patients.

## References

1. Curtis JJ, Walls JT, Boley TM, Schmaltz TI, Salam N. Coronary revascularization in the elderly: determinants of operative mortality. *Ann Thorac Surg* 1994; 85:1069-72.
2. Avery GJ, Ley SJ, Hill, JD, et al. Cardiac surgery in octogenarians: evaluation of risk, cost, and outcome. *Ann Thorac Surg* 2001;71:591-6.
3. Al-Nozha MM, Al- Maatouq MA, Al-Marzou YY, et al. Diabetes mellitus in Saudi Arabia. *Saudi Med J* 2004; 25(11):603-10.
4. Parsonnet V, Dean D, Bernstein AD. A method of uniform stratification of risk for evaluating the results of surgery in acquired adult heart disease. *Circulation* 1989;79(1):3-12.
1. Fatih I, Hasan R, Ozbek B, et al. Predictors of outcome after coronary artery bypass grafting in patients older than 75 years of age. *Med Sci Monit* 2003;9(8):369- 376.
6. Milo E, Cynthia A, Donna S Cost. Outcome and functional status in octogenarians and septuagenarians after cardiac surgery. *Chest* 2002; 122(4):1309-1315.
7. Antony J, Acinapura MD, Daniel M, et al. Coronary artery bypass in septuagenarians: analysis of mortality and morbidity. *Circulation* 1988;78(3):179-184.
8. Mohamed F Ibrahim, Domenico P, Joan I, Michael R Buchanan, Stephanie J Brister. Gender related differences in morbidity and mortality during combined valve and coronary surgery. *J Thorac Cardiovasc Surg* 2003;126(4):959-964.
9. Al-Nozha MM, Al-Khadra A, Arafah MR, et al. Metabolic Syndrome in Saudi Arabia. *Saudi Med J* 2005; 26(12):1918 - 1925.