

Adult Cardiac surgery in the elderly (octogenarians and above) - are we getting better?

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Abstract

Background: Cardiac surgery is being performed more frequently on the elderly. With an over-stretched budget to care for an aging population, our objective was to determine if we are getting better at managing these frail patients.

Methods: Institutional database was used to identify patients aged 80 or above undergoing cardiac surgery in Blackpool Victoria hospital NHS foundation trust, UK between June 1996 and June 2013. Outcomes between group 1 (June 1996-Dec. 2008; n=472) were compared to Group 2 (Jan. 2009-June 2013; n=607). Long-term survival was ascertained using NHS tracing-service.

Results: Group 2 patients included more males and had higher mean age and higher additive and logistic EuroSCORE I. Operative mortality was significantly improved while other complication rates were similar. Overall mean long-term survival was 114.1±4.1 months.

Conclusions: In the past 4 years despite the tight NHS budgets we have been able to double our workload of elderly patients' population and improve their hospital mortality with expectation of good long-term survival.

Keywords: octogenarians, adult cardiac surgery

Background

In our modern times there's an ever going increase in the average life expectancy. With this increase of age there is a higher incidence of cardiovascular disease and more elderly patients require cardiac surgery nowadays ⁽¹⁾. Medical advances in the pre- and postoperative care have led to the possibility that an increasing number of elderly patients can be operated on safely and have a satisfactory outcome. Currently, coronary artery bypass surgery, aortic and mitral valve surgery and major surgery of the aorta are performed in elderly patients with a satisfactory outcome ^(2,3). Nevertheless, this cohort of patients has an inherent potential of developing higher morbidity rates and the risk for these patients is only acceptable in the absence of comorbidities ⁽⁴⁾. It is only with proper patient selection criteria, attention to details and a high quality surgery that we would expect to see a satisfactory outcome. The care of elderly cardiac surgery patients is a multidisciplinary team approach requiring the cooperation of geriatricians, anesthesiologists, cardiologists, and cardiac surgeons, in order to obtain a specific treatment for each individual patient.

Methods

This study is representative of our practice in

Blackpool Victoria hospital NHS foundation trust, UK. Our institutional database was used to identify patients aged 80 or above undergoing cardiac surgery between June 1996 and June 2013. Our aim was to assess our unit's results in terms of morbidity and mortality over the last 4 years in this frail group of patients and compare the results to our early practice. We divided our patients into two groups, group 1 (June 1996-Dec. 2008; n=472) compared to Group 2 (Jan. 2009-June 2013; n=607). Long-term survival was ascertained using NHS tracing-service.

Results

Descriptive and Preoperative results:

Results showed that the current study population had a mean age of those in group 1 being 82.23 ± 2.33 vs 82.89 ± 2.66 in group 2 p=< 0.01 (Table 1). The age distribution is shown in (figure 1). The female population were less frequent in group 2 than group 1 38.7% (n=235) compared to 47.2% (n=223) respectively. Both groups had similar preoperative morbidity with regards to diabetes, renal dysfunction and LV functions (Table 1). Hypertension and pulmonary problems were significantly lower in group

1 compared to group 2 272 (57.6%) and 428 (70.5%) p<0.01; 38 (8%) and 94 (15.5%) p<0.01 (Table 1).

There was no statistical difference in terms of the different types of operations performed the variety and distribution of those operations is shown in (Fig. 2), or the priority of surgery in the two groups (Table 2). Both the additive and logistic Euroscore 1 were significantly higher in group 2 than group 1 (Table 2). Euroscore 2 could not be calculated as this is a retrospective study and the data was not available back in the time that would allow us to calculate it.

Outcomes:

Despite the lack of statistical difference yet, all parameters in the postoperative recovery period showed an improvement in the last 4-year period over the earlier years of cardiac surgery practice (Table 3) including postoperative stroke rate, reoperation for bleeding, and the need for hemofiltration, ICU stay and overall reduction in hospital stay.

The average hospital stay was between 13.7 and 14.42 days which is more than our 60 years old patients who had a mean hospital stay of 8.35 days between 2009 and 2013. The hospital mortality showed a significant improvement being 4.78% n= 29 in group 2 in comparison to group 1 10.8% n= 51.

Figure (1): Age distribution

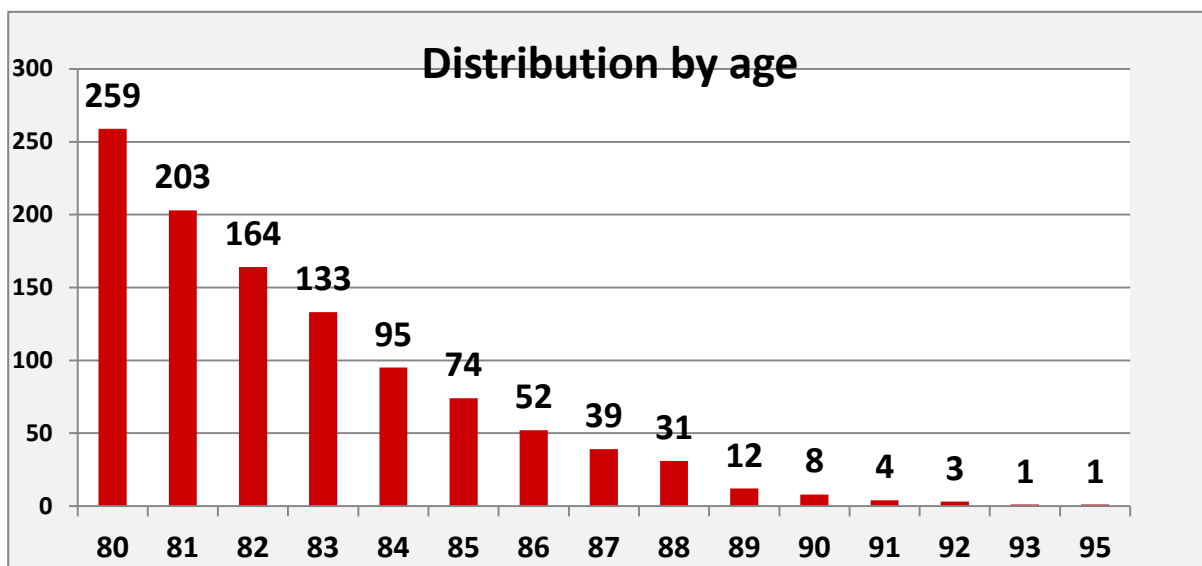
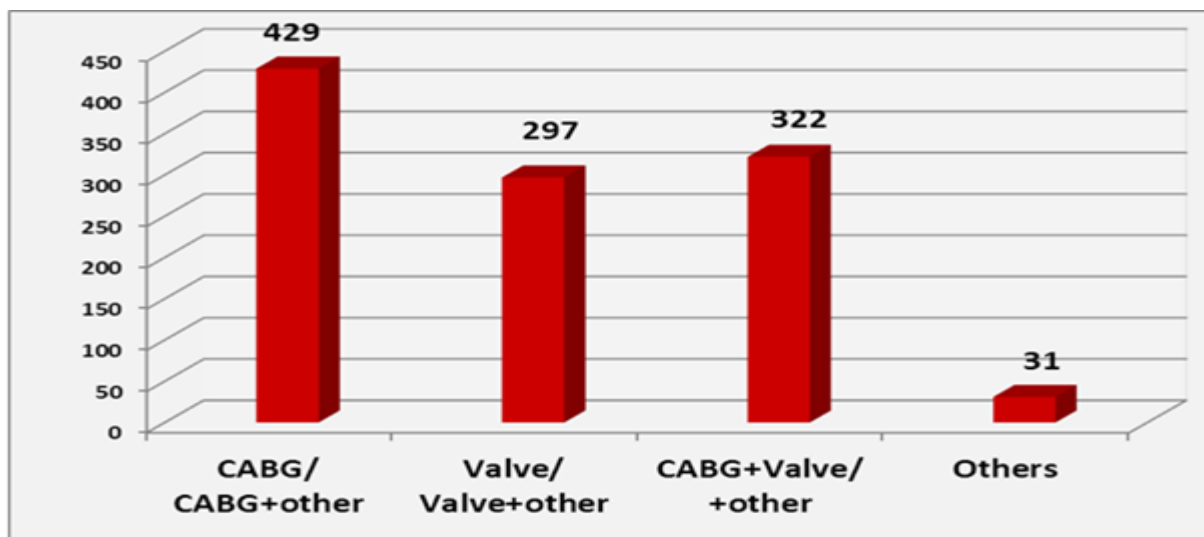


Figure (2): Types and distribution of the different types of cardiac procedures



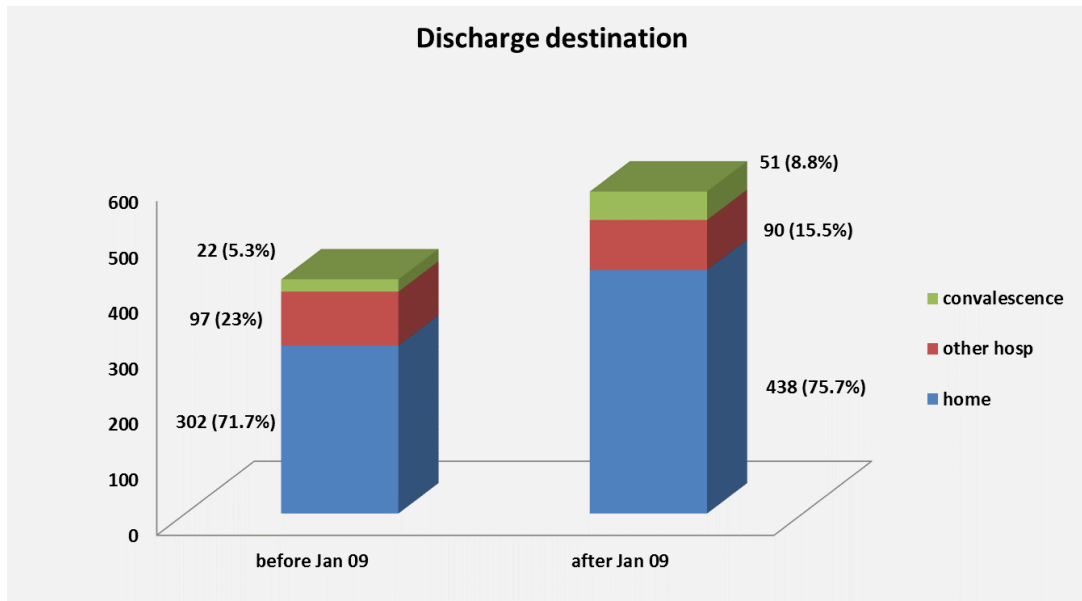


Figure (3): Discharge destination

Our long term follow up using the NHS tracing system was able to pick up patients up to ten years postoperatively. The number of hospital survivors was 999 and those of late deaths (after 30 days from date of discharge) was 238. 71.7% of group 1 and 75.7% of group 2 were discharged home Fig. (3). The mean survival time was 114 ± 4.05 months and the median was 110 ± 6.4 months Fig. (4). The survival curve before and after 2009 reflects a probable better long term survival after 2009 Fig. (5).

Discussion:

The major concerns with elderly cardiac surgery are raising costs of care, high operative mortality and the uncertainty about quality of life after surgery. Many studies revealed a more conservative trend towards the management of those patients ⁽⁵⁻⁸⁾. Our hospital mortality rate had a close range between 4.78% and 10.8% similar to other series ⁽⁹⁻¹³⁾.

Figure (4): Kaplan Meier long term survival curve. Survival at: 1 year - 94%; 2 years - 90%; 5 years - 75.6%; 10 years - 46.3%.

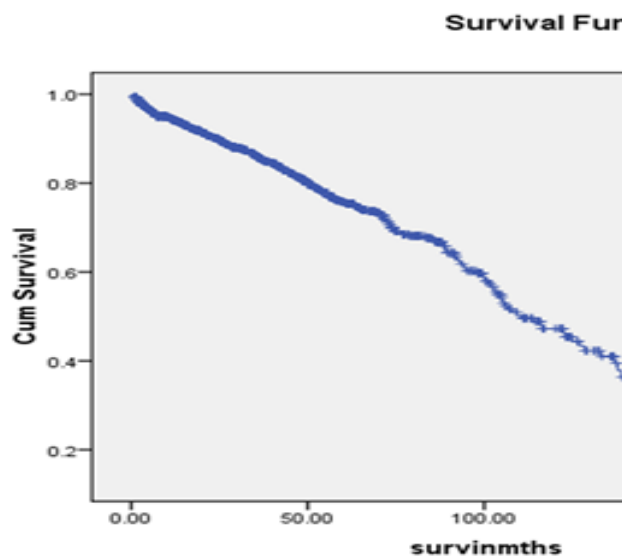


Figure (5): Survival comparison pre & post 2009.

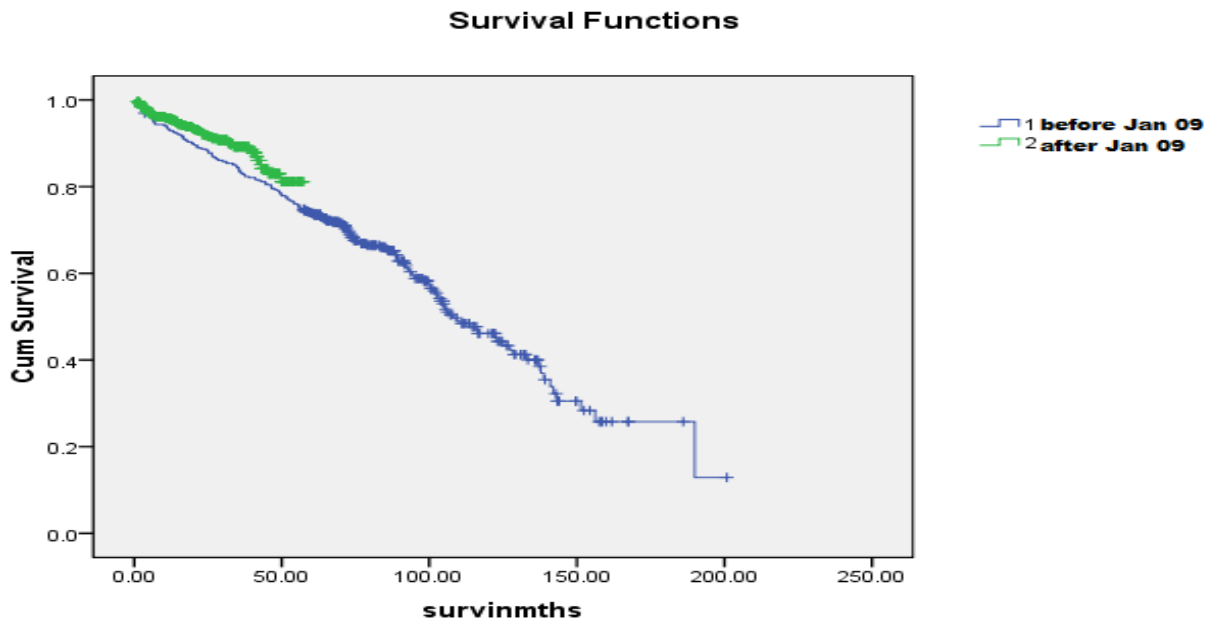


Table (1): Descriptive and preoperative results

characteristic	Group 1(n=472)	Group 2 (n=607)	significance of difference
mean age (yrs.)	82.23 ± 2.33	82.89 ± 2.66	p<0.01
females	223 (47.2%)	235 (38.7%)	p=0.005
diabetes	69 (14.6%)	89 (14.7%)	p=0.98
renal dysfunction	10 (2.1%)	11 (1.8%)	p=0.40
Hypertension	272 (57.6%)	428 (70.5%)	p<0.01
Pulmonary problems	38 (8%)	94 (15.5%)	p <0.01
redo surgery	7 (1.5%)	16 (2.6%)	p=0.19
poor LV	21 (4.4%)	34 (5.6%)	p=0.362
Aortic surgery	18 (1.7%)	13 (1.2%)	p=0.1

Table (2): Patient’s risk, different surgical procedures and surgical priorities.

characteristic	Group 1(n=472)	Group 2 (n=607)	significance of difference
procedure	200 (42.4%)	229 (37.7%)	p=0.09
- isolated CABG	112 (23.7%)	185 (30.5%)	
- isolated Valves	145 (30.7%)	177 (29.2%)	
priority	331(70.1%)	420(69.2%)	p=0.19
- elective	124(26.3%)	175(28.8%)	
- urgent	17(3.6%)	11(1.8%)	
- emergency			
Mean add EuroSCORE I	6.78±4.7	8.59±3.04	p<0.01
Mean log EuroSCORE I	12.11±10.1	13.44±10.66	p=0.04

Table (3): Postoperative outcome. Pulmonary, G.I. complications and S.Cr > 200 not requiring haemofiltration not different

* Average postop stay for 60 year old for 2009 – 2013 = 8.35 d

characteristic	Group 1 (n=472)	Group 2 (n=607)	significance of difference
C.V. event	10 (2.1%)	10 (1.6%)	p=0.63
- permanent	9 (1.9%)	8 (1.3%)	
- transient			
haemofiltration	22 (4.7%)	19 (3.1%)	p=0.19
reop for bleeding	31 (6.6%)	33 (5.4%)	p=0.28
ICU stay	2.54 d	2.23 d	p=0.58
Postop stay (mean)	14.42 d	13.7 d *	p=0.45
hospital deaths	51 (10.8%)	29 (4.78%)	p<0.01

In contrast to other studies which showed a greater variability in mortality ranges with different exclusion criteria (14-21), mortality rate was as low as 1.7% following isolated mitral valve surgery for degenerative disease (23) and as high as 19.6% for combined mitral and CABG surgery (18). Risk stratification in this age group is highly desirable, the Euroscore was found to overestimate the operative risk in octogenarians by Stoica and colleagues. Although the Euroscore II was previously validated in our general population group (24) for first time CABG and keeping in line with the findings of Stoica and colleagues the Euroscore would have overestimated the mortality in our Octogenarians by 72%. This may have resulted in a shift towards a more conservative management in this age group despite the fact that they could benefit more from surgical treatment with an acceptable outcome. In a study by El-Mistekawy et al., he found that the society of the thoracic surgery risk scoring (STS scoring system) was found to have a closer estimate of the mortality rates in octogenarians undergoing cardiac surgery (25). Between Jan.2009-June.2013 our 30 day hospital mortality had significantly dropped by 6.02%. This drop may reflect the advancement in all aspects of adult cardiac surgery, meticulous surgery and high level of care in the postoperative ITU. A greater percentage of group 2 were discharged home 75% but their functional status was not assessed upon their discharge to their homes, but judging from the paper by Aw et al., (26) who found that the major factor affecting the patients' independency post operatively is their preoperative state, one could predict that if they were independent preoperatively they should still remain to do so with or without mild impairments. Our long term survival curve (fig. 4) showed that the

survival at: 1, 2, 5, 10 years was 94%, 90%, 75.6% and 46.3% respectively. The comparative survival curve (Fig 5) between the 2 groups shows a better early survival rates with a predicted better long term outcome. Further studies are required to stratify the parameters which determine the areas of care that may produce a better outcome in this age group.

Conclusion:

Our results show an increasing workload of elderly patients with higher risk scores. Octogenarians are having an improvement in their hospital mortality with an acceptable complication rate and a proposed better long term survival, hence encouraging surgeons to take on more of these patients rather than a more conservative approach.

Conflicts of Interest

None of the authors have any competing interests to declare.

Authors' Contributions

FM: Wrote the article, collected data & is the corresponding author.

VS: Statistical analysis

MK: Data Collection

AD: Supervising consultant and did the critical reading.

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