The quality of life after cardiac surgery in octogenarians and evaluation of its early and mid-term results

Seksen yaş ve üzerinde kalp cerrahisi sonrası yaşam kalitesi, erken ve orta dönem sonuçların değerlendirilmesi

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ABSTRACT

Objective: The aim of this study is to evaluate our early and mid- term results and the qualities of life of the patients aged eighty years or older who underwent heart surgery.

Methods: Eighty- eight patients aged 80 years and older who underwent open-heart surgery at Göztepe Şafak Hospital between May 2004 and December 2010 have been included to the study. This study was designed as two-stage: in the first stage, determinants of survival were analyzed retrospectively. In the second stage, the quality of life of survived patients was evaluated by using Short- Form 36 (SF-36), Turkish version in the cross-sectional study. The statistical analysis was performed using Fischer's exact, Pearson Chi-square test, Student t-test, Mann-Whitney U test and logistic regression analysis.

Results: In the logistic regression analysis; the left ventricular ejection fraction as <50% (OR: 11.02, 95% CI: 2.6-46.6, p<0.05), application of redo surgery (OR: 8.3, 95% CI: 1.04-66.6, p<0.05), coronary bypass and mitral surgery procedures in the same session (OR: 9.2, 95% CI: 1.6-53.7, p<0.05), left main coronary lesion as >50% (OR: 4.3, 95% CI: 1.1-17.7, p<0.05), preoperative creatinine as >1.8 mg/dl (OR: 14.1, 95% CI: 2.6-76.1, p<0.01), New York Heart Association class III-IV (OR: 4.9, 95% CI: 1.2-20.1, p<0.05), chronic obstructive pulmonary disease (OR: 10.3, 95% CI: 2.5-41.7, p<0.01) were found to be risk factors of hospital mortality. Physical functions, social functions and all sub-scales other than the role limitation depending on the emotional situation were evaluated as general population mean or above.

Conclusion: We think that with a successful heart surgery in patients aged 80 years and older under appropriate conditions, their life qualities and mean life expectations can return to normal and they can lead a symptomless life. *(Anadolu Kardiyol Derg 2012; 12: 352-8)*

Key words: Cardiac surgery, octogenarian, quality of life, short form-36 scale, logistic regression analysis, survival

ÖZET

Amaç: Bu çalışmanın amacı seksen yaş ya da üzeri kalp cerrahisi uygulanan hastalarda erken ve orta dönem sonuçlarımızı ve yaşam kalitelerini değerlendirmektir.

Yöntemler: Göztepe Şafak Hastanesi'nde, Mayıs 2004 ile Aralık 2010 arasında açık kalp cerrahisi uygulanan 80 yaş ve üstündeki 88 hasta çalışmaya dahil edildi. Çalışma iki aşamalı olarak dizayn edildi. İlk aşamada, sağkalım belirleyicileri retrospektif olarak incelendi. İkinci aşamada, enine kesitli çalışma ile hayatta olan hastaların yaşam kaliteleri Short- Form 36 (SF-36), Türkçe versiyonu kullanılarak değerlendirildi. İstatistiksel analiz Fischer's exact, Pearson Chi-square testi ve lojistik regresyon analizi kullanılarak yapıldı. Sağkalım, Kaplan-Meier hayatta kalma eğrisi kullanılarak analiz edildi.

Bulgular: Lojistik regresyon analizde; sol ventrikül ejeksiyon fraksiyonu <%50 (OR: 11.02, CI: 2.6-46.6, p<0.05) redo cerrahi (OR: 8.3, CI: 1.04-66.6, p<0.05), koroner baypas ve mitral cerrahi prosedürlerin aynı seansta uygulanması (OR: 9.2, CI: 1.6-53.7, p<0.05), sol ana koroner lezyonu> %50 (OR: 4.3, CI: 1.1-17.7, p<0.05), preoperatif kreatinin> 1.8 mg/dl (OR: 14.1, CI: 2.6-76.1, p<0.01), kronik tıkayıcı akciğer hastalığı (OR: 10.3, CI: 2.5-41.7, p<0.01), hastane mortalitesi için risk faktörleri olarak bulundu. Fiziksel fonksiyonlar, sosyal fonksiyonlar ve emosyonel duruma bağlı rol kısıtlaması dışındaki tüm alt skalalar genel toplum ortalaması veya üzerinde değerlendirildi.

Sonuç: Seksen yaş ve üzeri hastalara uygun şartlarda yapılacak başarılı bir kalp cerrahisiyle yaşam kaliteleri ve ortalama yaşam beklentilerinin normale dönebileceği ve semptomsuz bir hayat sürebileceklerini düşünmekteyiz. *(Anadolu Kardiyol Derg 2012; 12: 352-8)*

Anahtar kelimeler: Kalp cerrahisi, 80 yaş ve üzeri, yaşam kalitesi, kısa form-36 ölçeği, lojistik regresyon analizi, sağkalım

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Introduction

The mean age and elder population rates increase in Turkey and in the world. According to data of the year of 2000, as in USA the population aged 85 and above was 4.2 million, it is estimated that this number shall be 8.9 million till the year of 2030 (1). According to World Health Organization's report, 13 millions of American citizens are now aged 75 and above and this number is expected to be 4 times in the next 50 years (2). In the United Kingdom, until the year of 2020, the population aged 80 and over is estimated to be approximately 6% (3). According to the data of the year of 2010, as in Turkey, population aged 65 and above constitutes 7% of the population, within the next 10 years it is expected that this 7% group will rise to 12-13% (4). In ages of eighty and above, the cardiovascular diseases are common. Approximately 25-50% of this age group is complaint of cardiac symptoms (3). As a result of the facts that the mean life duration increases, the success rates and diagnostic methods oriented for the heart diseases in the advanced age group and increase; the number of patients applying for the heart diseases treatments is increasing. Due to the technological developments in the heart and vascular surgery, development of modern surgery strategies and increase experience, the rates of treatment of the old patients with operation is gradually increasing in the last 10 years (5). With these developments in the heart surgery, the acceptable mortality rates in the old patients and the healed long-term survival rates are declared (5, 6). Aging is a process in which the pathological findings increase together with the decrease in the physiological reserve. With this reason, the risk factors that shall increase the perioperative mortality and morbidity should be well researched and the patients should be prepared to the operation in the best way (7). Nowadays, the satisfactory results related to the heart surgery in the old patients have been declared.

In this study, the hospital mortality in the octogenarians and the risk factors affecting this, mid-term survivals and life qualities were evaluated with Short Form-36 (SF-36) quality of life scale.

Methods

Study design

This study was designed as two-stage study. In the first stage, determinants of survival were analyzed retrospectively. In the second stage, the quality of life of surviving patients with the cross-sectional study was assessed.

Study population

The records of 88 patients aged 80 and above having open-heart surgery in Göztepe Şafak Hospital between May 2004 and December 2010 have been retrospectively analyzed. The male/female rate of these patients was 1.9/1. The mean age was 82.8±2.4 years. Among them, 66 patients underwent coronary artery bypass graft (CABG) (1 patient redo); 6 patients-CABG+

mitral valve replacement (MVR) and mitral repair; 5 patients-CABG+aortic valve replacement (AVR); 3 patients-MVR; 5 patients-AVR; 1 patient-CABG+atrial septal defect repair; 1 patient-CABG+ascending aorta separated graft interposition and 1 patient-redo MVR+AVR procedure.

All patients were informed about the study and their consent was obtained. The study protocol was approved by local Ethics Committee.

Data collection

By scanning the hospital records retrospectively, the cases' demographical features, pre-operative situations and risk factors, hospital mortality, intraoperative and postoperative courses were reviewed. Patients preoperative, perioperative and postoperative data and hospital mortalities were reached by examining the retrospective hospital records. Patients who died and their death dates were determined from the information obtained from the patients' relatives by making telephone connections,. The survived patients were called to the polyclinics control. In the control of these patients, SF-36 was used for evaluating the life qualities. The results of the SF-36 quality of life scale of patients after surgery was evaluated by examining literatures and the overall mean of Turkish population.

Variables

The left ventricular ejection fraction, application of redo surgery, left main coronary artery lesion, preoperative creatinine values, chronic obstructive pulmonary disease (COPD), peripheral artery disease, hyperlipidemia, emergency operation, hypertension, diabetes mellitus, NYHA (New York Heart Association) class III-IV, gender and age were recorded by scanning the hospital records retrospectively. Hypertension was defined as the active use of antihypertensive drugs or documentation of blood pressure more than 140/90 mmHg (8). Diabetes mellitus was defined as fasting plasma glucose levels over 126 mg/dl or glucose level over 200 mg/dl at any measurement or active use antidiabetic treatment (8). Hyperlipidemia was defined as plasma low-density lipoprotein levels >130 mg/dl or cholesterol levels >200 mg/dl (8). The determinant of creatinine was defined as plasma creatinine levels >1.8 mg/dl or <1.8 mg/dl, COPD was defined as the active use of bronchodilator drugs or documentation of respiratory function test less than 80%. The left ventricular ejection fraction was defined as <50% or >50%. The left main coronary artery stenosis was defined as >50%.

As surgery variables, the use of internal mammarian artery (IMA) or saphenous vein grafts, cardiopulmonary bypass or off-pump, cardiopulmonary bypass and aortic cross-clamp time and the surgical procedures were analyzed.

The saphena wound site infection, mediastinitis, reintubation, bleeding or revision due to sternal dehiscence, temporary or permanent neurological deficit, inotrope and intra-aortic balloon pump requirement and mortality rate were investigated in the post-operative period.

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Short Form-36 questionnaire

SF-36 that we have used in our study is a form having generic criteria feature in the quality of life scales and which is widely used and providing wide angled measurement. It is not specific to any old, disease or treatment group. It is a quality of life evaluation questionnaire which is appropriate to be used in the clinic practices and researches, easy to implement, takes less time, but is comprehensive and containing general health concepts. It was developed and brought into use by SF-36 Rand Corporation in the year of 1992 (9). The Turkish validity study of this form was firstly realized by Koçyiğit (9) in the year of 1999 and was adapted to the Turkish population. In SF-36's Turkish reliability studies, for each sub-scale, Cronbach alpha coefficient has been calculated and has been found over 0.70 (10). The scale is composed of 36 questions. The SF-36 produces eight scale scores for eight domains of health status: physical functioning (PF), role limitation depending on the physical problems (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role limitation depending on the emotional problems (RE) and mental health (MH). For each scale, scoring between 0-100 is realized. The lowest score means the poor health situation; the highest score means the best health situation. The SF-36 scale scores can be used to derive two summary measures of health status: physical component summary (PCS) and mental component summary (MCS). The PCS includes scales assessing PF, RP, BP and GH. The MCS includes scales assessing VT, SF, RE and MH. The PCS and MCS are standardized to reflect a general population mean of 50 and a SD of 10. There is also an item containing the change perception in the health in the last 12 months. Other than this item, evaluation is made by considering the last 4 weeks (9).

Statistical analysis

Statistical analysis was performed using SPSS 13.0 for Windows software (SPSS Inc., Chicago, IL, USA). For the numeric variables, mean±standard deviance, for categorical variables, percentage numbers were given. We studied the association of preoperative and perioperative variables and hospital mortality with logistic regression analysis. The independent risk factors were evaluated with the logistic regression analysis. Odds ratio's (OR) are presented with 95% confidence intervals (95% CI). When appropriate, Chi-square, Fisher's exact test, Student t-test and Mann-Whitney U test were used. Kaplan-Meier product limit method was used for analysis of cumulative survival curves.

Results

The preoperative demographic information and risk factors of the patients are given in the Table 1. In the majority of the patients taken to the operation (66 patients, 75%), the diagnosis has been coronary artery disease.

Operative and perioperative findings

The left internal mammary artery usage rate was 68.2% and saphena graft usage - 74%. Nine patients (10.2%) were operated with off-pump surgery, 79 (89.8%) patients - using cardiopulmonary bypass. The mean cross-clamp and cardiopulmonary bypass durations were 49±32.4 and 78.5±41.4 minutes, respectively. Six of the patients were taken to operation under emergency conditions and others in the elective conditions. Two of the patients underwent emergency CABG operation; one of them-AVR+ascending aorta separated graft interposition, one of them-CABG+ ascending aorta replacement, one-redo MVR+AVR and one-CABG+MVR. The median and mean stay duration in the emergency care were 2, 4.9 (range 1-52) days respectively and the median and mean stay duration in the hospital has been 8, 11.1 (range 1-62) days respectively. The saphena wound site infection, mediastinitis, reintubation, bleeding or revision due to sternal dehiscence, temporary neurological deficit, inotrope and intra-aortic balloon pump requirement (IABP) were the factors extending the emergency care and hospital stay duration and increasing the morbidity. The hospital mortality rate was 12.5% (11 patients). Five of these patients died after isolated CABG, 3 of them after CABG+ mitral valve replacement or repair, 2 of them after redo surgery, 1 of them after isolated mitral valve replacement.

The risk factors affecting the hospital mortality and logistic regression analysis results are shown in the Tables 2 and 3.

Totally 88 patients were monitored as 157.3 patient year. The mean follow-up period was 3.1±1.7 (range 0.1-6) years. In Kaplan Meier survival analysis (Fig. 1) of all of our patients, 1st year survival was found as 82.9% (95% CI 74.8-90.1), 3rd year survival - as 71.6% (95% CI 66.7-82.5), 5th year survival - as 61.3% (95% CI 56.9-71.4).

Table 1. Preoperative demographic data and risk factors

Variables	
Gender, male/female, n (%)	58/30 (34.1/65.9)
Age, years	82.8±2.4
NYHA class III-IV, n (%)	35 (39.8)
LVEF> 50%, n (%)	65 (73.9)
LVEF< 50%, n (%)	23 (26.1)
Creatinine> 1.8 mg/dL, n (%)	7 (7.9)
Diabetes mellitus, n (%)	33 (37.5)
COPD, n (%)	14 (15.9)
Hypertension, n (%)	60 (68.2)
Emergency operation, n (%)	6 (6.8)
Redo surgery, n (%)	2 (2.3)
Left main coronary stenosis, n (%)	11 (12.5)
Hyperlipidemia, n (%)	24 (27.3)
Peripheral artery disease, n (%)	21 (23.9)

Data are presented as mean±SD and numbers of patients (percentage)
COPD - chronic obstructive pulmonary disease, LVEF - left ventricular ejection fraction, NYHA - New York Heart Association

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Table 2. Analysis of factors affecting hospital mortality

Variables	Nonsurvivors			Survivors			p*
	Number	%	mean±SD	Number	%	mean±SD	
Age			83.2±4.4			82.8±2.1	0.6
Gender, male	8	13.8		50	86.2		0.7
Diabetes mellitus	6	18.2		27	81.8		0.3
Hypertension	10	16.7		50	83.3		0.2
Hyperlipidemia	5	16.7		25	83.3		0.5
COPD	6	42.9		8	57.1		<0.01
Creatinine> 1.8mg/dL	4	57.1		3	42.9		<0.01
NYHA III-IV	8	22.9		27	77.1		<0.05
Emergency operation	2	33.3		4	66.7		0.1
Post-operative AF	5	18.5		22	81.5		0.3
CABG+Mitral intervention	3	50		3	50		<0.05
Smoking	5	11.4		39	88.6		0.75
LVEF<50%	8	34.8		15	65.2		<0.001
Off-pump	1	11.1		8	88.9		0.7
CPB	10	12.7		69	87.3		0.6
LMCS>50%	4	33.3		8	66.7		<0.05
Redo surgery	3	60		2	40		<0.05

Data are presented as mean±SD and numbers of patients (percentage)
*Student t-test for independent samples, Chi-square test, Fisher's exact test, Mann-Whitney U test
AF-atrial fibrillation, CABG-coronary artery bypass graft surgery, COPD- chronic obstructive pulmonary disease, CPB-cardiopulmonary bypass, LVEF- left ventricle ejection fraction, LMCS-left main stenosis, NYHA-New York Heart Association

Complications

It was recorded that in 32 of our patients (20.4% / patient year) there were complications. In 7 of the patients (4.5% / patient year) the sternal dehiscence had happened. Four of them underwent repair after the appropriate medical treatment by establishing mediastinitis diagnosis and 3 of them underwent repair with resternotomy due to dehiscence. Five (3.2% / patient year) patients were taken to the bleeding revision. Other complications were: in 14 of the patients (8.8% / patient year) - respiratory failure; in 10 of them (6.4% / patient year) - saphena wound site infection; in 27 of them (17.2% / patient year) - atrial fibrillation; in 20 of them (12.7% / patient year) - need for inotrope support; in 6 of them (3.8% / patient year) - temporary neurological deficit and in 9 of them (5.6% / patient year) -IABP requirement.

Results of the quality of life with the SF-36

In 41 of 45 patients living, the physical and mental health conditions were evaluated under two main headings by using SF-36 quality of life scale. As a question article in the quality scale evaluates, the last one-year health, 4 patients were left out of assessment. SF-36 raw score scale is shown in the Fig. 2 according to Turkey general population mean. After the linear transformation was applied to transform the raw score scale to

Table 3. Logistic regression analysis of factors affecting hospital mortality in the octogenarians

Variables	OR	95% CI	p*
Redo surgery	8.333	1.042-66.596	0.045
LVEF <50%	11.022	2.606-46.605	0.011
LMCS >50%	4.317	1.052-17.712	0.042
Preoperative creatinine >1.8mg/dL	14.095	2.612-76.062	0.002
COPD	10.350	2.566-41.738	0.001
CABG+mitral intervention	9.250	1.593-53.697	0.013
Preoperative NYHA class III, IV	4.938	1.209-20.167	0.026

*Multiple logistic regression analysis
CI - confidence interval, COPD - chronic obstructive pulmonary disease, LMCS - left main coronary stenosis, LVEF - left ventricular ejection fraction, NYHA - New York Heart Association, OR - odds ratio

50 mean and 10 standard deviation, the same data are shown in the Fig. 3. When the normative data were compared with the general population mean, it was observed that it was below all sub-scale normative values other than the mental health. Together with this, it was found that the patients have got scores over 50% of all sub-scales of SF-36 and the lowest score mean was the general health score (69.4±7.2), the highest score mean was the mental health score (80.8±4). The score mean belonging

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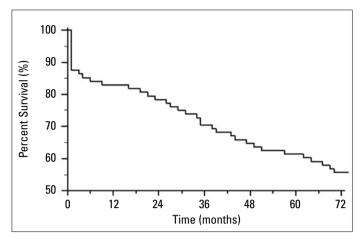Anadolu Kardiyol Derg
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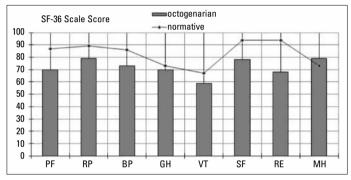**Figure 1. Kaplan-Meier cumulative survival curve**

Figure 2. SF-36 scoring, using normative data for Turkish general population, total sample in octogenarians: RE, BP and SF values are significantly lower in octogenarians (p<0.01, p<0.05, p<0.05 and p<0.01 compared with the normative values)

BP - bodily pain, GH - general health, MH - mental health, PF - physical functioning, RE - role-emotional, RP - role-physical, SF - social functioning, SF - 36 - short form-36, VT - vitality
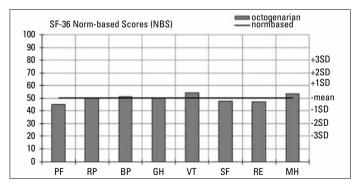

Figure 3. SF-36 norm-based scale score against Turkish general population means, in octogenarian after implementing linear transformations to transform raw scale score to a mean of 50 and standard deviations of 10. Physical functioning value is significantly lower in octogenarians (p<0.05 compared with the norm-based scale score)

BP - bodily pain, GH - general health, MH - mental health, PF - physical functioning, RE - role-emotional, RP - role-physical, SF - social functioning, SF - 36 - short form-36, VT - vitality

to the other sub-scales are presented in the Fig. 2. In the norm-based comparison, all of the sub-scales other than PF, SF and role emotional were equivalent to the general population mean or above.

Discussion

In this study, left ventricular ejection fraction <50%, application of redo surgery, coroner bypass and mitral surgery procedures in the same session, left main coronary lesion >50%, preoperative creatinine>1.8 mg/dl, NYHA class III-IV, chronic obstructive pulmonary disease have been found as risk factors for the hospital mortality in octogenarians. Physical functioning, role-emotional, bodily pain and SF values significantly lower in octogenarian (p<0.01, p<0.05, p<0.05, p<0.01 compared with the normative values), physical functioning value significantly lower in octogenarian (p<0.05 compared with the norm-based scale score) but all the other sub-scale have been the general population mean or above.

Mortality, morbidity and risk factors

In octogenarians, the hospital mortality has been declared as 5.6% by Friedrich et al. (5), 8.9% by Johnson et al. (1), 11% by Kohl et al. (11), 8.8% by Schmidtler et al. (12) for CABG and 9.5% for MVR. In our patients, the hospital mortality rate has been found as 12.5 %. This rate has been a little bit higher according to the literature values. We explain its reason with the realization of combined interventions such as additional valve replacement or repair to CABG in the patients in whom mortality is developed, continuation of the renal dysfunction in the postoperative period, being EF<50%, that the patients who are preoperative COPD have been reintubated due to respiratory failure. In some studies, it has been shown that the applied surgery procedure has negatively affected the mortality and morbidity. Toker et al. (13) has informed that with isolated or ischemic heath disease, combined mitral valve or aorta valve interventions has been a factor increasing the mortality. Alexander et al. (14) have evaluated the postoperative results of the advanced age patients in a very wide series of 67.764 diseases having heart operation in 22 hospitals in USA. In this study, they have declared hospital mortality as 8.1% in the patients to whom CABG is applied, as 10.1% in the ones to whom AVR is applied together with CABG and as 19.6% in the ones to whom MVR is applied together with CABG. The reasons of the increased hospital mortality here appear to us as extended operation time and insufficient myocardial protection. In our study, the combined procedures in which CABG and mitral valve replacement or repair have been realized together has been found as a factor increasing the hospital mortality in logistic regression analysis (Table 3).

NYHA class III-IV patient group has been mentioned to be a feature increasing the early mortality. With this reason, it has been emphasized that the advanced age patients have been required to be operated without waiting till NYHA class IV (11, 15). In our study, it has been determined that the patients having operation with the class III-IV complaints have been a risk factor for the hospital mortality in the logistic regression analysis.

In some writings, it has been declared that IMA usage has affected the long term life in the positive way. Wiedemann et al. (16),

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in mini review that they have done, have given perioperative mortality as 8.2% among the old patients having isolated CABG by only using saphena graft and this rate as 24.1% in the emergency cases. Interestingly, they have given the hospital mortality as 2.3% in the old patients having isolated CABG in which IMA has been used. The hospital mortality has been found as 3.4% in our patients having isolated CABG by using İMA and as 4.5% in our patients in whom only saphena graft is used. Again in the same study, when compared to the patient group aged 70 and below, the woman rate in the old patient group has been mentioned to be high importantly (17). In some studies, the female gender has been mentioned as the distinct risk factor increasing the mortality (17). The male/female rate in our patients has been 1.9/1 and its relationship with the hospital mortality has not been statistically significant (p=0.7).

In most of the studies (5, 18, 19); diabetes, hypertension, myocardial infarction, congestive heart failure, COPD, mitral and/or aorta valve disease requiring intervention, serious left ventricular function disorder, emergency operation, cerebrovascular disease, that the serum creatinine level is high have been declared as risk factors for the early mortality. The logistic regression analysis results of our study (Table 3) support these risk factors mentioned in the literature.

In the patients having coronary artery disease, if the operative risk is too high, the hybrid revascularization is an option, which is required to be considered. In these patients, by using İMA, the anterior interventricular ramus is built up with blood, and at the 2nd stage, with stent, the veins in which there are obstructions are intervened (20). In our study, to 3 high-risk patients, hybrid revascularization has been applied. To three of these patients, off-pump coronary bypass has been applied. Also, that the patients having coronary bypass are operated under off-pump or cardiopulmonary bypass has not been statistically significant for perioperative mortality (p=0.58).

Survival

De Mol et al. (18) has given 4-year survival rate in the old patients as 73.5% and the independent living rate of these patients as 75.9%. In the same study, the left ventricular ejection fraction being below 50% has been mentioned to increase the late death risk 2.5 times. In another study, Mortasawi et al. (21) have researched the short and long-term results of the patients having isolated CABG aged over 80. They have declared the 1, 2 and 3 years survival as 89.9%, 84.3%, 67.4% respectively. In this study, that EF <50%, multi-coronary artery disease, perioperative IABP usage and symptomatic pericardial effusion have been mentioned as predictors related to the mortality. In some studies (12, 22), it has been mentioned that after a successful surgery in the patients whose left ventricular functions have been protected, the old patients can regain their normal living expectations. Also, severity and number of the comorbidity have been shown as a determinative factor for the long term prognosis in the same study. In our study, with Kaplan-Meier survival curve analysis, the

patients 1, 2, 3, 4 and 5 year survival percentages have been; 82.9%, 78.4%, 71.6%, 64.8% and 61.4% respectively. The causes of related to heart were responsible for most late death.

Quality of life

In the recent years, the number of studies made about quality of life after the open heart surgery is increasing. The quality of life gains importance in the chronic diseases such as especially heart disease. The aim in many patients with chronic disease is not only the survival of the patient, but also to increase the quality of life. Although the cost of the heart surgery is higher than young patients due to mortality, major complication, intensive care and duration of hospital stay, it is more effective in terms of increasing the quality of life (3, 23, 24). Huber et al. (22) have examined the postoperative quality of life of 136 octogenarian patients. They have reported that in 93% of the patients there have an important decrease in the cardiac symptoms, in 90% of them there have not been any complaints for the last 4 weeks and 94% of all patients have been satisfied with the treatment. Graham et al. (25) have declared that in patients aged over 80, with the surgery revascularization treatment, very good results can be achieved and even after 3 years, the satisfaction level has been high. In our study, for evaluating the quality of life in octogenarians, SF-36 scale has been used. In our study, the norm-based score scale and all other scales other than PF, SF and RE were found to be similar to the general population mean or over. After the linear transformation was applied to transform the raw score scale to mean of 50 and standard deviation of 10 in our patients, according to the general population mean, PCS was found as 48.1% and MCS-51.8%.

Study limitations

Our study was performed in a single institution. It would have been better if this study was carried with a larger sample size and a multicenter study. We evaluated only early and mid-term outcome of octogenarians and did not perform a long-term follow-up.

Conclusion

When the gradual increase of the old persons in the population and the frequency of the heart diseases are considered, it is observed that in old persons, increasing number of heart operation shall be required. In today's conditions, age has no longer been contraindication for the heart operation. The preoperative physiological and functional situation of the patients, the accompanying diseases, good analysis of the myocardium functions can decrease early mortality and morbidity. The aim of the heart surgery in the octogenarians is not only to extend the life duration, but also to provide a life which can do its duties and which is independent and qualified. In these patients, we consider that an intensive postoperative care that an experienced and well-organized team will give together with the appropriate surgery technique may provide long term survival, symptomless and comfortable life to the patients of 80 years and older.

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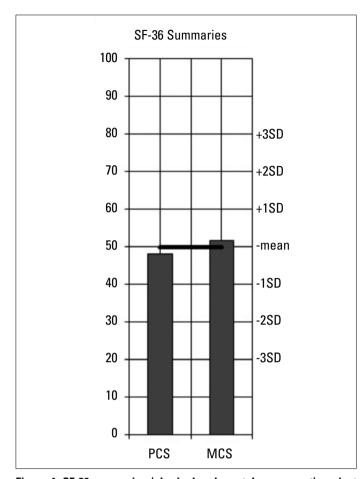
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Figure 4. SF-36 summaries (physical and mental component) against Turkish general population means, in octogenarian after implementing linear transformations to transform raw scale score to a mean of 50 and standard deviations of 10

MCS - mental component summary, PCS - physical component summary, SF - 36 - short form-36

Conflict of interest: None declared.

Authorship contributions: Concept - İ.K.; Design - Y.A.; Supervision - İ.K.; Resource - İ.K.; Material - C.K.; Data collection&/ or Processing - C.A.; Analysis &/or interpretation - İ.K.; Literature search - İ.K.; Writing - İ.K.; Critical review - İ.K.; Other- T.Y.

References

1. Johnson WM, Smith JM, Woods SE, Hendy MP, Hiratzka LF. Cardiac surgery in octogenarians: does age alone influence outcomes? Arch Surg 2005: 140: 1089-93. **[CrossRef]**
2. World Health Organization: The Global Burden of Disease: 2004 Update. Geneva, World Health Organization 2008.
3. Freeman WK, Schaff HV, O'Brien PC, Orszulak TA, Naessens JM, Tajik AJ. Cardiac surgery in octogenarian: per-operative outcome and clinical follow-up. J Am Coll Cardiol 1991; 18: 29-35. **[CrossRef]**
4. Repuclic of Turkey. Institute of Statistics Prime Ministry, Turkey. Available from: http//www.tuik.gov.tr/Start .do.
5. Friedrich I, Simm A, Kötting J, Thölen F, Fischer B, Silber RE. Cardiac surgery in the elderly patient. Dtsch Arztebl Int 2009; 106: 416-22.
6. Fruitman DS, MacDougall CE, Ross DB. Cardiac surgery in octogenarians: can elderly patients benefit? Quality of life after cardiac surgery. Ann Thorac Surg 1999; 68: 2129-35. **[CrossRef]**
7. Frilling B, von Renteln-Kruse W, Riess FC. Prognostic value of geriatric assessment prior to cardiac surgery of the elderly. JACC 2009; 53: A403-18.
8. Third Report of the Expert Panel on Detection, Evaluation,and Treatment of High Blood Cholesterol in Adults (ATP III Final Report). National Institutes of Health, National Heart, Lung, and Blood Institute. National Cholesterol Education Program. NIH Publication No. 02-5215, September 2002.
9. Ware JE Jr, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. Med Care 1992; 30: 473-83. **[CrossRef]**
10. Koçyiğit H, Aydemir O, Fişek G, Ölmez N, Memiş A. Kısa Form-36 (KF-36)'nın Türkçe versiyonunun güvenilirliği ve geçerliliği. Romatizmal hastalıkları olan bir grup hasta ile çalışma. İlaç ve Tedavi Dergisi 1999; 12: 102-6.
11. Kohl P, Kerzmann A, Lahaye L, Gerard P, Limet R. Cardiac surgery in octogenarians; peri-operative outcome and long-term results. Eur Heart J 2001; 22: 1235-43. **[CrossRef]**
12. Schmidtler FW, Tischler I, Lieber M, Weingartner J, Angelis I, Wenke K, et al. Cardiac surgery for octogenarians- a suitable procedure? Twelve-year operative and post-hospital mortality in 641 patients over 80 years of age. Thorac Cardiovasc Surg 2008; 56: 14-9. **[CrossRef]**
13. Toker ME, Mataracı I, Çalışkan A, Eren E, Erdoğan HB, Zeybek R, et al. Open heart surgery and results in patients population aged 80 years and older. Turkish J Thorac Cardiovasc Surg 2009; 17: 151-6.
14. Alexander KP, Anstrom KJ, Muhlbaier LH, Grosswald RD, Smith PK, Jones RH, et al. Outcomes of cardiac surgery in patients> or= 80 years: results from the National Cardivascular Network. J Am Coll Cardiol 2000; 35: 731-8. **[CrossRef]**
15. Pierard LA. Cardiac surgery in octogenarians: who, when and how? Eur Heart J 2001; 22: 1159-61. **[CrossRef]**
16. Wiedemann D, Bernhard D, Laufer G, Kocher A. The elderly patient and cardiac surgery- a mini rewiev. Gerontology 2010; 56: 241-9. **[CrossRef]**
17. Kirsch M, Guesnier L, LeBesnerais P, Hillion ML, Debauchez M, Seguin J, et al. Cardiac operation in octogenarians: perioperative risk factors for death and impaired autonomy. Ann Thorac Surg 1998; 66: 60-7. **[CrossRef]**
18. De Mol BA, Kallewaard M, Lewin F, Van Gaalen GL, van den Brink RB. Single-institution effectiveness assessment of open-heart surgery in octogenarians. Eur J Cardiothorac Surg 1997; 12: 285-90. **[CrossRef]**
19. Dalrymple-Hay MJ, Alzetani A, Aboel-Nazar S, Haw M, Livesey S, Monro J. Cardiac surgery in the elderly. Eur J Cardiothorac Surg 1999; 15: 61-6. **[CrossRef]**
20. Moon MR, Sundt TM 3rd, Pasque MK, Barner HB, Gay WA Jr, Damiano RJ Jr. Influence of internal mammary artery grafting and completeness of revascularization on long-term outcome in octogenarians. Ann Thorac Surg 2001; 72: 2003-7. **[CrossRef]**
21. Mortasawi A, Rosendahl U, Schröder T, Albert A, Ennker IC, Ennker J. Isolated coronary bypass operation in the 9th decade of life (in German). Z Gerontol Geriatr 2000; 33: 381-7. **[CrossRef]**
22. Huber CH, Goeber V, Berdat P, Carrel T, Eckstein F. Benefits of cardiac surgery in octogenarians-a postoperative quality of life assessment. Eur J Cardiothorac Surg 2007; 31: 1099-105. **[CrossRef]**
23. Tsai TP, Chaux A, Matloff JM, Kass RM, Gray RJ, DeRobertis MA, et al. Ten-year experience of cardiac surgery in patients aged 80 years and over. Ann Thorac Surg 1994; 58: 445-51. **[CrossRef]**
24. Cane ME, Chen C, Bailey BM, Fernandez J, Laub GW, Anderson WA, et al. CAGB in octogenarians: Early and late events and acturial survival in comparison with a matched population. Ann Thorac Surg 1995; 60: 1033-7. **[CrossRef]**
25. Garham MM, Norris CM, Galbraith PD, Knudtson ML, Ghali WA. Quality of life after coronary revascularization in the elderly. Eur Heart J 2006; 27: 1690-8. **[CrossRef]**