

Quality of life before and after coronary artery bypass grafting: findings among pre-operative and post-operative patients at the National Hospital of Sri Lanka

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Abstract

Background: Cardiovascular disease is a main cause of morbidity and mortality worldwide. Coronary artery bypass grafting (CABG) is a common method of treatment for patients with coronary artery disease, which is known to improve quality of life (QoL). However little is known about how CABG affects QoL in the Sri Lankan setting.

Objective: The purpose of this study therefore was to document the pre-operative and post-operative QoL of the patients undergoing CABG at the National Hospital of Sri Lanka (NHSL).

Methods: This descriptive cross sectional study was conducted from January-March 2013 in the thoracic unit and cardiology unit of NHSL on two groups of patients matched for age, gender and body mass index: pre-operative patients awaiting CABG (pre-CABG) and post-operative patients who had undergone CABG (post-CABG); with 50 subjects in each group. The health and functioning, socio-economic, psychological/spiritual and family subscales of QoL were assessed using Ferrans and Powers Quality of Life Index – Cardiac IV Version.

Results: The post-CABG group had higher mean scores for overall QoL and health and functioning, psychological/spiritual and family subscales and lower mean scored for social and economic subscale than the pre-CABG group, regardless of age and gender. In the post-CABG group, older patients had significantly higher scores for health and functioning subscale than younger patients ($p < 0.05$).

Conclusion: QoL was better in most aspects in the post-CABG group than the pre-CABG group, especially among the older patients.

Key words: coronary artery bypass grafting, quality of life, pre-operative and post-operative

Introduction

By the end of the 20th century, cardiovascular diseases (CVD) had become the major cause of death globally.¹ An estimated 17.3 million people died from CVD in 2008, representing 30% of all global deaths² and 7.3 million deaths were due to coronary heart disease (CHD).³ Over 80% of CVD deaths take place in low and middle-income countries and occur in almost equal numbers in men and women.²

In 2003 CVD was ranked within the first few leading cause of hospital deaths in Sri Lanka,⁴ with 524 deaths per 100000 population, higher than that observed in many high income countries.⁵ CHD is the leading cause of death in Sri Lanka and has accounted for 34% of deaths in an autopsy study.⁶ In comparison, CHD accounts for only 17% of deaths in the United States.⁷

Coronary artery bypass grafting (CABG) is commonly used to treat CVD worldwide.⁸ Data obtained from The Society of Thoracic Surgeons revealed that the number of patients undergoing CABG was gradually increasing.⁹ In 2008, 408000 in-patient bypass procedures were performed in the United States.⁷ In Sri Lanka, 1480 cardiothoracic surgeries have been performed in the National Hospital of Sri Lanka (NHSL) in 2007, most of them being CABG.¹⁰

Traditionally, outcomes such as mortality or morbidity have been used to assess therapeutic interventions.¹¹ Along with the substantial decline in operative mortality with CABG over the past 30 years, quality of life (QoL) has also become an important outcome to more clearly define the benefits and risks associated with cardiac surgeries and assist patients to make better informed treatment decisions.¹²

The ACC/AHA guidelines for CABG suggest that an improvement in QoL is the primary indication for the operation.¹³ Thus, in addition to survival, QoL has become an important outcome of bypass surgery. Hence, there is growing interest in using QoL outcomes as a tool to

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evaluate the benefits risks ratio associated with CABG to help clinicians to make decisions towards the surgery.

Currently CABG has become one of the major open heart surgeries, performed annually both in governmental and non-governmental sectors of Sri Lanka. Though there are a significant number of CABG surgeries performed in Sri Lanka, there is a dearth of published data on the QoL of patients before and after CABG in the local context. The purpose of this study therefore was to document the pre-operative and post-operative QoL of the patients undergoing CABG at the NHSL, which may aid clinical reasoning and post-CABG rehabilitation.

Methodology

This descriptive cross sectional study was conducted over 3 months (January-March 2013) in the thoracic unit and cardiology unit of NHSL on two groups of patients: pre-operative patients awaiting CABG (pre-CABG) and post-operative patients who had undergone CABG (post-CABG); with 50 subjects in each group. The pre-CABG group, was selected from patients awaiting their first CABG in the thoracic unit, 1-7 days prior to surgery. The post-CABG group was selected from patients who had undergone CABG 10-15 months before, managed post-operatively in the rehabilitation program in the cardiology department and attending cardiology clinics at NHSL. They had followed the same pre-operative process. Convenience sampling was used and each post-CABG patient was matched with the pre-CABG counterpart for age, gender and body mass index (BMI). Patients who underwent any cardiac, thoracic, aortic or vascular procedures other than CABG were not included in the study. Informed written consent was obtained from the participants. Ethics clearance was obtained from the Ethics Review Committee of the Faculty of Medicine, University of Colombo. All patients had their standard anthropometric measurements [weight, height and body mass index (BMI)] obtained.

The study tool was the interviewer administered Ferrans and Powers Quality of Life Index – Cardiac IV Version, which has been used successfully in a number of treatment evaluations, including cardiac transplants, heart and lung transplants, cardiovascular disease, stroke and CABG.¹⁴ It measures satisfaction with different aspects of life as well as importance of each of these aspects to the individual. Both satisfaction and the importance sections contain 35 items which the respondents had to rate on a 6-point scale ranging from 1 (very dissatisfied/unimportant) to 6 (very satisfied/important) and from the following subscales; health and functioning, social and economic, psychological/ spiritual, and family. The range of scores for each subscale is 0-30. Scores are calculated by weighting each satisfaction response with its paired importance response, summing the response, and dividing by the number of items answered. As the Ferrans and Powers Quality of Life Index – Cardiac

IV Version has not been culturally adapted and validated for Sri Lanka, the questionnaire written originally in English, was translated into Sinhalese and Tamil, back translated and pre-tested. QoL scores were calculated according to the Ferrans and Powers guidelines. Statistical analyses were performed with SPSS version 17.0.

Results

Sample characteristics

The pre-CABG and post-CABG groups each consisted of 50 participants (male: female 30:20 in each). Means of parameters in the pre-CABG and post-CABG groups were compared using independent sample T test. As there were no significant differences in means ($p>0.05$) of age, weight, height and BMI, between the two groups, (Table 1), the pre-CABG and post-CABG groups can be considered homogenous.

Quality of life in the pre-CABG and post-CABG groups

Mean scores for health and functioning, social and economic, psychological/spiritual and family subscales of QoL and overall QoL in pre-CABG and post-CABG groups are shown in Table 2.

The post-CABG group had higher mean scores than the pre-CABG group for overall QoL and all subscales of QoL except the social and economic subscale, which had the lowest score in the post-CABG group. The highest scores in both groups was in the family subscale. The health and functioning subscale, which had the lowest score in the pre-CABG group, had the second highest scores in the post-CABG group.

Variation of quality of life with gender in pre-CABG and post-CABG groups

Mean scores for health and functioning, social and economic, psychological/spiritual and family subscales of QoL and overall QoL were compared between men and women in each of pre-CABG and post-CABG groups using independent sample T test. There was no significant difference ($p>0.05$) in QoL scores between men and women in either group (Table 3).

Variation of quality of life with age in pre-CABG and post-CABG groups

Mean scores for health and functioning, social and economic, psychological/spiritual and family subscales of QoL and overall QoL of elder (age ≥ 60 years) and younger (age <60 years) patients were compared in each of pre-CABG and post-CABG groups using independent sample T test. There was no significant difference ($p>0.05$) in QoL scores between men and women in each of the two groups except in the health and functioning subscale ($p<0.05$) of the post-CABG group, for which the older group had higher scores (Table 4).

Table 1. Comparison of sample characteristics between pre-CABG and post-CABG groups

		<i>n</i>	<i>Mean</i>	<i>SD</i>	<i>T value</i>	<i>P value</i>
Age (years)	Pre-CABG	50	57.24	6.22	0	1
	Post-CABG	50	57.4	6.22		
Height (m)	Pre-CABG	50	1.59	0.09	-1.227	0.223
	Post-CABG	50	1.61	0.08		
Weight (kg)	Pre-CABG	50	66.76	9.68	-0.637	0.526
	Post-CABG	50	67.92	8.49		
BMI (kg/m) ²	Pre-CABG	50	26.44	2.76	-0.116	0.908
	Post-CABG	50	26.50	2.62		

BMI-body mass index, CABG-Coronary artery bypass grafting, SD-Standard deviation

Table 2. Descriptive analysis of QoL in pre-CABG and post-CABG groups

<i>Subscale of QLI</i>	<i>Pre-CABG group</i>		<i>Post-CABG group</i>	
	<i>n</i>	<i>Mean score (+/-SD)</i>	<i>n</i>	<i>Mean score (+/-SD)</i>
Health and functioning	50	16.64 (1.20)	50	24.55 (1.15)
Social and economic	50	22.02 (1.97)	50	20.03 (1.93)
Psychological/spiritual	50	20.03 (1.93)	50	24.39 (1.04)
Family	50	23.74 (1.77)	50	25.52 (1.95)
Overall QoL	50	19.51 (0.90)	50	24.24 (0.71)

CABG-Coronary artery bypass grafting, QLI-Quality of life index, QoL-Quality of life, SD-Standard deviation

Table 3. Variation of QoL scores with gender in pre-CABG and post-CABG groups

<i>Subscale of QLI</i>	<i>Gender</i>	<i>Pre-CABG group</i>				<i>Post-CABG group</i>		
		<i>n</i>	<i>Mean score (+/-SD)</i>	<i>T value</i>	<i>P value</i>	<i>Mean score (+/-SD)</i>	<i>T value</i>	<i>P value</i>
Health and functioning	Male	30	16.56 (1.28)	-0.583	0.563	24.49 (1.12)	-0.477	0.636
	Female	20	16.76 (1.09)			24.65 (1.22)		
Social and economic	Male	30	21.80 (2.01)	-0.943	0.350	22.48 (1.99)	-0.345	0.732
	Female	20	22.34 (1.91)			22.66 (1.47)		
Psychological/spiritual	Male	30	20.07 (2.21)	0.161	0.873	24.25 (1.05)	-1.153	0.255
	Female	20	19.98 (1.48)			24.59 (1.02)		
Family	Male	30	23.70 (1.84)	-0.181	0.857	25.80 (2.05)	1.248	0.218
	Female	20	23.79 (1.70)			25.10 (1.75)		
Overall QoL	Male	30	19.44 (0.97)	-0.628	0.533	24.21 (0.75)	-0.361	0.720
	Female	20	19.60 (0.79)			24.29 (0.67)		

CABG - Coronary artery bypass grafting, QLI-Quality of life index, QoL-Quality of life, SD-Standard deviation

Table 4. Variation of QoL scores with age in pre-CABG and post-CABG groups

Subscale of QLI	Age group	n	Pre-CABG group			Post-CABG group		
			Mean score (+/-SD)	T value	P value	Mean score (+/-SD)	T value	P value
Health and functioning	Elder	15	16.84 (1.32)			25.05 (0.55)		
	Younger	35	16.56 (1.15)	0.750	0.457	24.34 (1.28)	2.052	0.000
Social and economic	Elder	15	22.19 (1.99)			22.75 (1.97)		
	Younger	35	21.94 (1.99)	0.402	0.689	22.46 (1.73)	0.521	0.605
Psychological/ spiritual	Elder	15	19.54 (1.81)			24.54 (0.82)		
	Younger	35	20.24 (1.97)	-1.179	0.244	24.32 (1.13)	0.694	0.491
Family	Elder	15	23.53 (1.50)			25.61 (1.94)		
	Younger	35	23.83 (1.88)	-0.530	0.599	25.48 (1.98)	0.212	0.833
Overall QoL	Elder	15	19.54 (0.91)			24.54 (0.64)		
	Younger	35	19.49 (0.91)	0.160	0.874	24.11 (0.72)	1.997	0.052

CABG-Coronary artery bypass grafting, QLI-Quality of life index, QoL-Quality of life, SD-Standard deviation

Discussion

Pre and post-operative QoL

The ACC/AHA guidelines for CABG suggest that improvement in QoL is a primary indication of CABG.¹³ This study revealed that the QoL was higher in both men and women after CABG, which is supported by published literature.^{16-21,22-29} It was interesting to note that higher scores were seen in all domains of QoL in the post-CABG group, except the socio-economic domain. These differences may be attributed to multiple factors, eg. the direct benefits of revascularization with enhanced cardiovascular function due to CABG, or factors indirectly linked to the surgery and ischaemic heart disease such as post-operative rehabilitation program, dietary changes, smoking cessation and psychological benefits. However, this was only a descriptive study which was not aimed at identifying what caused the improvement in QoL post-CABG. The lower scores obtained for the socio-economic domain in the post-CABG group may be due to multiple reasons: though the CABG was carried out in the state sector, the expenses incurred during and after surgery may be higher than what was anticipated, the ability for income generation may have not improved as expected despite better physical well-being, inability to regain the financial losses during the period of illness and recovery and inadequate time for expected improvements in socio-economic status following CABG, as the post-CABG patients were recruited within only 10-15 months after surgery.

QoL variations with gender

The results of this study indicate that there are no significant gender differences in QoL either before or after CABG. Our findings are consistent with other studies^{27,29} which show similar improvements in QoL in both genders

after CABG, whereas some studies^{16,18,20,22} have found a poorer recovery in terms of QoL in women. The non-significance of gender difference in the present study may be due to the small sample size. However, the explanatory power and validity of studies might be limited by either small sizes and/or different time frames. And also after surgery, the traditional role demands may be particularly stressful for women and may thus enhance the disparities in QoL.

QoL variations with age

In our study, QoL in post-CABG group was better than that in the pre-CABG group regardless of age. According to United Nations age of 60 years was used as the cut-off to define the elder population in this study¹⁵. We found that pre-CABG QoL scores were similar and QoL was better than the pre-CABG group in the post-CABG group in both older and younger patients. In fact, older patients showed both higher scores and also greater differences in scores in all the subscales as well as the overall QoL scores. These findings suggest that older patients can expect similar differences in QoL post-operatively as their younger counterparts, which is also reported in other studies.^{17,18,22} As seen in other studies^{18,22} our findings demonstrated that, there was a remarkable difference in QoL in health and functioning domain in >60 years group compared with their <60 years group. This subscale dealing with general health, symptoms and activities of daily living is thought to be significantly better in the elders after CABG. It is also interesting to note the higher QoL scores in the post-CABG group among the older patients, compared to the younger ones in all subscales as well as the overall score, which was not seen in the pre-CABG group. A possible explanation for this finding is that younger patients face different

challenges in their post-operative lives with higher expectations at home and work which they may not have been able to fulfill, leading to lower reported QoL.

There are several limitations identified in this study. The sample size is small and it was difficult to match pre-operative subjects with post-operative subjects on age, gender and BMI, as two separate groups were studied before and after CABG, rather than following up the same cohort and evaluating the differences in QoL between pre-CABG and post-CABG groups. It is also possible that there is a selection bias in the post-CABG group, as the post-CABG patients attending the rehabilitation program in the cardiology department and attending cardiology clinics at NHSL are a motivated group who may therefore have a better outcome and QoL. Pre and post-CABG QoL may be influenced by factors such as non-cardiac problems and pre-operative, peri-operative and post-operative surgical complications which were not evaluated.

Conclusion

This study focused on the evaluation of the QoL of two groups of patients before and after CABG. In the post-CABG group, the QoL associated with health and functioning, psychological and spiritual activities and family life as well as overall QoL appear to be better than in the pre-CABG group, though their QoL linked to social and economic activities seem worse than in the pre-CABG group. The higher scores for QoL in the post-CABG group were reported, regardless of age and gender. However, in the post-CABG group, the elders report significantly better QoL related to health and functioning compared to their younger counterparts. Conducting the study at the NHSL, a major center for the cardiac surgeries in Sri Lanka, enhances the generalizability of the results of this study. Larger studies using a more representative sample, following up the same cohort in prospective studies which also consider co-morbidities would be useful in strengthening the above findings.

Declaration

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