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Survival, clinical status and quality of life one year after cardiovascular surgery

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ABSTRACT

Introduction: Hospital outcomes of cardiac surgery have been well studied and reported at national and international levels, but survival data is not abundant in our country.

Objective: To establish survival and determine social functioning of patients one year after cardiovascular surgery.

Method: An observational, descriptive, cross-sectional study was conducted with patients who underwent surgery over the last three years at the Cardiovascular Surgery Department of the CIMEQ Hospital. Patients were interviewed at the cardiovascular surgery consultation and their medical records were analyzed in order to incorporate the study variables (demographics, survival, functional classification, social functioning, reoperations, complications, and other non-cardiac surgeries).

Results: 186 patients were included, who had a survival of 95.17 % at one year, with a clinical improvement over 96 %, in additional testing and functional class. The level of overall social functioning of these patients increased from "neutral or indifferent" to "very satisfied or satisfied" in 85.9 % of cases.

Conclusions: Survival figures at one year, patients' return to working life, the level of social functioning, and the clinical improvement in additional testing after cardiovascular surgery that have been reached by the CIMEQ Hospital are at the level of those shown by hospital which are leaders in developed countries of Europe and America.

Key words: Cardiovascular surgery, Survival, Anesthesiology, Quality of life

Sobrevida, estado clínico y calidad de vida al año de la cirugía cardiovascular

RESUMEN

Introducción: Los resultados hospitalarios de la cirugía cardíaca están bien estudiados y divulgados en los ámbitos nacional e internacional, pero la información de la sobrevida no es abundante en nuestro país.

Objetivo: Precisar la sobrevida y determinar el funcionamiento social al año, de los pacientes con cirugía cardíaca.
Método: Se realizó un estudio observacional, descriptivo, de corte transversal de los casos operados en los últimos tres años por el Servicio de Cirugía Cardiovascular del Cardiocentro CIMEQ. Se entrevistaron los pacientes en la consulta de cirugía cardiovascular y se analizaron sus historias clínicas para incorporar las variables del estudio (demográficas, sobrevida, clasificación funcional, funcionamiento social, reintervenciones, complicaciones y otras cirugías no cardíacas).
Resultados: Se incluyeron 186 pacientes, los que tuvieron una sobrevida al año del 95,17 %, con más del 96 % de mejoría clínica, en complementarios y en clase funcional. El nivel de funcionamiento social global de estos casos aumentó de "neutral o indiferente" a "muy satisfecho o satisfecho", en el 85,9 % de los casos.
Conclusiones: Las cifras de sobrevida al año, reincorporación a la vida laboral, nivel de funcionamiento social y la mejoría clínica y en los complementarios después de la cirugía cardiovascular, alcanzadas por el Cardiocentro CIMEQ, están a nivel de las que presentan los hospitales líderes de los países desarrollados de Europa y América.
Palabras clave: Cirugía cardiovascular, Sobrevida, Anestesiología, Calidad de vida

INTRODUCTION

Hospital outcomes of cardiac surgery and its determinants have been well studied and reported by numerous registries, some of which have helped to develop predictive models of hospital mortality risk[1,2]. Although information on survival years after coronary and valve surgery is abundant[3-10], it is not so ample in our country, and less so on the clinical outcome and quality of life of our patients. Furthermore, survival studies at one year do not always allow us to compare, in a reliable way, survival with a reference population from different geographic regions and social contexts[10], because the statistics generated in a country are not comparable with those from another, since it is not possible to extrapolate genetics, food and climate, among other factors, not to mention the medical and hospital environment.

The use of new techniques (video-assisted mitral and aortic valve replacement, cardiac resynchronization, video-assisted myocardial revascularization, endoscopic saphenous vein harvesting, extracorporeal circulation with micro-priming and vacuum-assisted venous drainage, among others) has allowed a high quality care for our patients[9,11-13]. These new techniques, together with other factors (development of coronary and structural interventions, intra-aortic stent implantation, etc.), have allowed the intervention in increasingly difficult cases, and with good results (mortality rate of 3.8 % in 2009 and 3.6 % in 2010). However, their postoperative outcome, quality of life and reintegration into society and workplace has not been well assessed in our country. Knowing the level of satisfaction these individuals experience in their everyday activities is becoming a critical element for specialists.

Because of this, and the increased complexity of surgical cases at the Cardiovascular Surgery Department of the Center for Medical-Surgical Research (CIMEQ, for its acronym in Spanish) in Havana, Cuba, the study was conducted in order to establish survival at one year and determine the level of social functioning of patients who had undergone cardiac surgery in this medical center, also to describe some demographic variables, assess clinical changes and the patients' level of social functioning before surgery and one year after surgery, considering complications, reoperations and non-cardiac surgeries.

METHOD

An observational, descriptive, cross-sectional study was conducted with patients who underwent surgery at the Cardiovascular Surgery Department of the CIMEQ Hospital, from October 2008 to October 2011.

The study included all patients of both sexes and over 18 years of age who had undergone elective surgery in that hospital in the aforementioned period, one year after surgery. Patients with thoracic or abdominal aortic surgery were excluded, as well as those who died within the period that is considered to be surgical mortality (within 30 days after surgery), who require another type of analysis and are not included on survival.

Patients were interviewed at the cardiovascular surgery consultation, as they were reaching the first year after surgery. Their medical records were analyzed to include the necessary preoperative variables, which were distributed as follows:

1. Demographic variables: age, sex, diagnosis, type of surgery performed, and comorbidities.
2. Survival: cause of death and postoperative lifetime.
3. Clinical focus: postoperative symptoms one year after surgery (patient's comparison level), additional preoperative and postoperative testing and preoperative and postoperative functional classification according to the New York Heart Association (NYHA).
4. Social functioning: It was assessed through an interview in which patients reported their level of satisfaction concerning their role performance. The instrument used was the social functioning scale designed by Valencia *et al*[14]. It consists of 35 aspects (seven for each assessment area) and explores five areas of life (occupational, social, economic, sexual and family areas) with a rating system which includes 5 levels. This instrument is validated for use in Spanish-speaking countries and is widely used in our country for patients diagnosed with malignant diseases. It was used before surgery and one year after surgery. Thus the level of overall social functioning of the individual was determined, as well as their functioning in each area at both moments.
5. Postoperative variables: cause and date of reoperation, complications and other surgeries.

A form for primary data collection was prepared. The SPSS version 13.1 for Windows XP was used for its analysis, and inferential statistics were conducted. The results are presented in tables and figures.

RESULTS

In the period under review, 207 patients underwent surgery at the Cardiovascular Surgery Department of the CIMEQ Hospital, of which 11 patients died before 30 days, who were regarded as surgical mortality, and therefore, were excluded from the study. Ten patients who underwent thoracic aortic surgery were also excluded. The remaining 186 patients predominantly had valvular (44.09 %) or coronary (43.01 %) diseases. Combined cases or those undergoing other interventions were a minority (**Table 1**).

There was a predominance of males and the average age was 58 years, ranging between 27 and 84 years.

As seen in **Table 2**, among those patients undergoing surgery for ischemic heart disease, the most important comorbidities included hypertension, previous myocardial infarction, unstable angina and left ventricular dysfunction, while in those surgically treated for valve disease, pulmonary and systemic arterial hypertension predominated.

Table 1. Distribution of cases, according to the type of surgery (n=186).

Type of surgery	Nº of cases	Total Nº (%)
Coronary surgery		
Double mammary artery with beating heart	57	80 (43,01)
Other coronary surgeries	18	
Video-assisted coronary surgery	5	
Valvular surgery		
Aortic valve replacement	38	82 (44,09)
Mitral valve replacement	34	
Double-valve replacement	6	
Video-assisted mitral valve replacement	4	
Combined (mixed) surgery	10	10 (5,38)
Other surgeries		
Atrial septal defect surgery	4	14 (7,52)
Video-assisted cardiac resynchronization	3	
Video-assisted pericardial window	3	
Atrial myxoma	2	
Video-assisted pericardial diverticulum	1	
Constrictive pericarditis	1	

In the period covered by the study, only 9 complications were found between 31 and 365 days after surgery (**Figure 1**). There were 9 deaths over the three years of the study (**Table 3**), 4 of them with coronary artery disease, 3 with mitral valve replacement, 1 with a combined case (aortic-coronary surgery) and 1 with infective endocarditis of the prosthetic valve. The mean

Table 2. Comorbidities (n=186).

Comorbidities	Coronary	Valvular	Combined	Others	Total	
	Nº de pacientes				Nº	%
Hypertension	65	28	1	2	96	51,6
Previous myocardial infarction	49	7	0	2	58	31,2
Unstable angina	44	0	2	0	46	24,7
Poor LV systolic function	34	12	0	3	49	26,3
Diabetes mellitus	17	17	2	1	37	19,9
Pulmonary hypertension	7	25	0	2	34	18,3
Congestive heart failure	7	12	0	3	22	11,8
Obesity	12	8	0	0	21	11,3
COPD	3	7	1	0	11	5,9
Reoperations	0	5	1	0	6	3,2
Chronic renal failure	3	2	1	0	6	3,2
Bronchial asthma	1	3	0	1	5	2,7
Peripheral arterial insufficiency	2	0	0	0	2	1,1

Legend: LV, left ventricle; COPD, chronic obstructive pulmonary disease

Table 3. Mortality at one year. CIMEQ Hospital. Three-year cut-off.

Time (days)	Primary surgery	Age	Sex	Cause of death
38	Coronary	73	M	Pulmonary fibrosis
42	Coronary	76	F	Generalized sepsis
45	Mitral valve replacement	44	F	Cerebral aneurysm
49	Coronary	68	M	Generalized sepsis
52	Combined (aortic-coronary)	65	M	Generalized sepsis
59	Coronary	59	M	Generalized sepsis
61	Prosthetic valve endocarditis	41	M	Endocarditis
120	Mitral valve replacement	70	F	Valve thrombosis
364	Mitral valve replacement	56	F	Valve thrombosis

age of these patients was 61.3 years. Of them, 55.55 % died without leaving the hospital, 44.44 % due to septic causes; 66.66 % had postoperative atrial fibrillation and 55.55% were male.

In the interview, 96.83 % of patients said they felt clinical improvement after surgery; 99.36 % of them had additional tests (echocardiogram, exercise testing and coronary angiography) with better parameters, compared to those they had before surgery, and 95.56 % improved their functional class, according to the NYHA classification. It should be noted that some of the patients were in functional class I before surgery (congenital), so they could not improve their functional class after surgery.

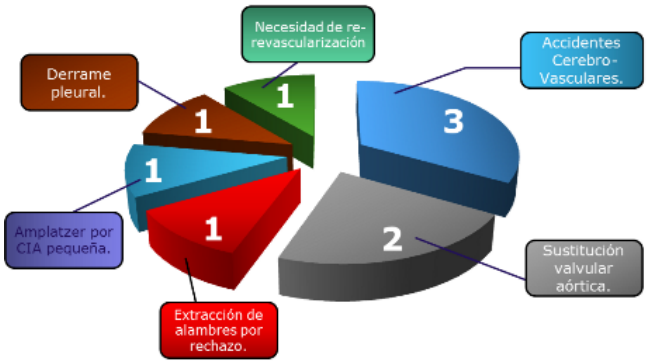

Figure 1. Complications.

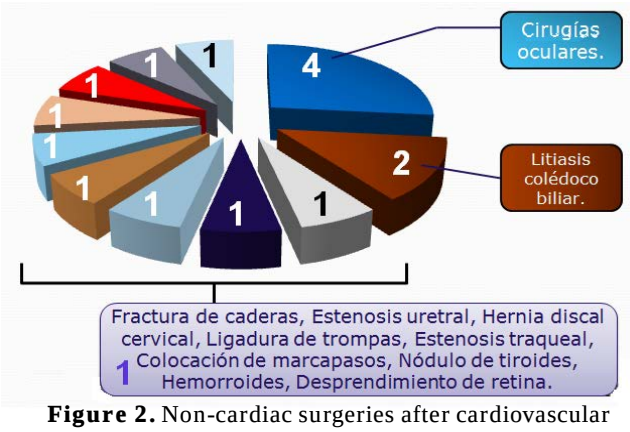

Figure 2. Non-cardiac surgeries after cardiovascular intervention.

Of the total of patients, 127 had a job at the time of surgery, of which 91 (57.59 %) returned to work, while 36 took retirement, mainly because they had already reached retirement age.

After adding the levels obtained in each of the explored areas, and dividing it by the total of these areas, it was determined that the level of social functioning perceived by the subjects after surgery was "very satisfied", unlike the perception they had before, which was neutral or indifferent (**Table 4**).

Table 4. Level of social functioning before and after surgery.

Level of overall social functioning (All areas)	Mean of the areas			
	Before		Before	
	Nº	%	Nº	%
Very satisfied	5	2,6	117	62,9
Satisfied	21	11,2	43	23,1
Neutral or indifferent	119	63,9	21	11,2
Dissatisfied	24	12,9	3	1,6
Very dissatisfied	17	9,1	2	1,1
Level of functioning	3		1	

In this group of patients, 15 non-cardiac surgeries were performed after the cardiovascular intervention, as described in **Figure 2**.

DISCUSSION

Survival, in the short and medium term, and the quality of life of patients who have been discharged alive from hospital after cardiac surgery, have improved[11,12,15]. This has been observed in coronary surgery[13,16], in valvular surgery[17] and in combined coronary and valvular surgery[18], both in octogenarian patients[19] and in those with serious left ventricular failure[20].

In a study conducted in the province of Villa Clara with patients who underwent coronary surgery, it is stated that males in Cuba are more affected by cardiovascular diseases[2]; which is consistent with our results. This could be due to the fact that men have increased risks factors. They smoke more, drink more alcohol, and most often hold leadership positions that lead to stress; however, there is consensus that sex should not be a factor that alters the decision-making regarding the conduct of a particular procedure[2].

Regularly, mortality and survival rates are reported, and, to a lesser extent, complications[21,22]; however, the literature at our disposal reports few studies about the quality of life after surgery.

In Cuba, heart disease is the leading cause of death[2,23], and there are six surgical cardiovascular centers for the care of all cardiovascular patients. The statistics from these hospitals (clinical, interventional and surgical statistics) are collected and sent to the National Cardiac Network, which is the organization responsible for processing the data of the country.

The surgical statistics of a surgical cardiovascular center include a number of variables that are collected from the time the patient undergoes surgery until 30 days after surgery. These patients are followed up by surgery or cardiology outpatient consultations for life. However, despite the follow-up by either specialty, in our country there are no official statistics after 30 days. An assessment of the quality of health care in the cardiac surgery performed in a given hospital requires comparing it to other hospitals, but this is hampered by differences in the selection of study

patients and the heterogeneity of risk factors, those which are present and those which are assessed.

The study of the survival rate at one year also presents some difficulties in this type of hospital, but it is even more difficult to study and compare the level of satisfaction in patients, and their return to social life and family activities after cardiac surgery. Our country lacks a track record, in the medium and long term, for patient undergoing surgery. There is also a lack of publications on the survival and quality of life of these patients. We might ask ourselves: To what extent do we operate and discharge patients with limitations in their social life?

Experimental and clinical evidence suggests that patients with cardiovascular disease, both coronary and valvular diseases, suffer from progressive and irreversible conditions in which surgery is often the only solution[5,6].

The mortality found in this research shows a bimodal curve, where one group died, on average, at 49 days (sepsis and postoperative atrial fibrillation) and the other group died on average at 242 days (valve thrombosis).

The 9 deaths, from a total of 186 patients, represent a mortality rate of 4.83 % per year (and, in consequence, a survival of 95.17 % at one year). When compared with the meta-analysis by researchers at the Innsbruck Medical University in Austria[11], which includes more than one hundred thousand patients undergoing elective cardiac surgery between 1980 and 2009, with a mortality rate of 4.17 % per year, the survival at one year at the Cardiovascular Surgery Department of the CIMEQ Hospital may be considered to be on the level with the European cardiology hospitals[1,11,12,21,22].

Conducting non-cardiac surgery in a patient who previously underwent cardiac surgery is a positive indicator of the quality of life achieved[24,25]. It is good to note that the surgical treatment of an underlying heart disease is often decided based on findings during the preoperative assessment of a non-cardiac disease. Other times, the second operation is due to findings during cardiovascular surgery or its complications (such as urethral stricture). The fact that over 10 % of our patients could undergo a non-cardiac surgery within the first year after cardiac surgery, with zero mortality and without cardiovascular complications, is an undeniable indicator of the quality of life they enjoy.

CONCLUSIONS

The survival figures at one year, the level of return to working life, level of social functioning, clinical improvement, and improvement in additional testing that have been reached by the Cardiovascular Surgery Department of the CIMEQ Hospital in patients who underwent cardiovascular surgery are on the level with those shown by hospitals which are leaders in developed countries of Europe and America.

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