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Sexual Quality of Life in Men <60 Years Old after Coronary Bypass Surgery

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ABSTRACT

Purpose: To explore the effect of undergoing coronary artery bypass grafting on sexual quality of life as an integral part of patients' health-related quality of life.

Methods: This cross-sectional study included 265 men ages 18 to 60 years (median age, 55) who underwent coronary artery bypass grafting 1 to 5 years before the study. Standardized questionnaires were implemented to evaluate participant pre- and postoperative sexual quality of life and the quality of counseling provided to patients.

Results: Among the patients, 77% were in a steady relationship. The general health score was 5.5 ± 2.8 (mean ± standard deviation) preoperatively and 6 ± 2.2 at follow-up (P = .01). No sexual counseling was given to 83% and 77% of the patients pre- and postoperatively, respectively. The mean sexual satisfaction score dropped from 6.5 ± 2.6 preoperatively to 4.7 ± 3 postoperatively (P < .001). The decline in sexual intercourse frequency and masturbation frequency was significant (P < .001 and P = .006, respectively). Linear regression analysis showed that general health status (P = .008), higher-quality counseling (P = .027), and preoperative sexual quality of life (P < .001) correlated positively with sexual quality of life, whereas sternal pain (P < .001), erectile dysfunction (P < .001), and fear of excessive cardiac burden (P < .001) correlated negatively.

Conclusions: Middle-aged men experience decreased sexual quality of life after coronary artery bypass grafting. Preoperative sexual quality of life, general health, and higher-quality counseling positively affect postoperative sexual quality of life, whereas sternal pain, fear, and erectile dysfunction play a negative role. Pre- and postoperative care guidelines should be improved. Further prospective large cohort studies for males and females are required.

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INTRODUCTION

Coronary heart disease (CHD) remains one of the leading causes of morbidity in adults worldwide. Besides physical capacity, CHD also limits patient functional capacity and impairs quality of life [Lukkarinen 2007]. This affects the patient's sexual functioning, an effect that increases with CHD severity [Lukkarinen 2007].

Coronary artery bypass grafting (CABG) improves mid- and long-term health-related quality of life (HRQoL), including improvement of physical activity, mobility, and sleep quality and freedom from fear, angina, or depression, with better emotional well-being [Herlitz 2003; Sjöland 1997; Folks 1986; Caine 1991; Dueñas 2012; Cohen 2011]. However, only a few studies have included patient sexual well-being as a parameter for HRQoL [Sjöland 1997; Jenkins 1983; Foruzan-Nia 2011; Langeluddecke 1989; Lai 2011; Papadopoulos 1986]. Sexual health is an important part of HRQoL [WHO 2002; Lindau 2010]; hence, it is a concern for patients undergoing CABG [Lai 2011]. Therefore, this study aimed to explore the effect of CABG on patients' sexual functioning and satisfaction.

METHODS

Study Design

This was a cross-sectional, retrospective, follow-up study. Standardized questionnaires were implemented to evaluate the state of sexual quality of life (sQoL) in men after CABG compared with before surgery, to evaluate the quality of information provided by caregivers to patients pre- and postoperatively. Further analysis helped identify the risk factors associated with poorer sQoL. The study was approved by the institutional review board of the Carl Gustav Carus Faculty of Medicine (Dresden University of Technology, Dresden, Germany; decision number EK 332082013, August 2013). Written consent was obtained from all patients who participated in the study.

Patient Selection

From 2007 to 2011, all patients who underwent coronary artery surgery at the Dresden Heart Centre were scanned

Table 1. Clinical Data Analysis*

Variable	Result
Preoperative data	
Age (y)	55 (51 to 57)
Steady partner (%)	77
Urgent or emergent cases (%)	27.6
EuroSCORE (%)	1.3 (0.8 to 2.3)
BMI	28.2 ± 4
Diabetes Mellitus (%)	34.6
Ejection fraction <50% (%)	31.5
History of myocardial infarction (%)	26.4
Unstable angina pectoris (%)	8.7
3-vessel disease (%)	71
2-vessel disease (%)	24
Single-vessel disease (%)	5
Extracardiac atherosclerosis (%)	17.8
Postoperative data	
CVI	0
Dialysis	2
CABG revision	3
PCI	2
Sternal wound complications	5
Hospital stay (d)	9 (7 to 11)

*Data are median (interquartile range), mean ± SD, or n unless noted otherwise.
BMI indicates body mass index; CVI, cerebrovascular incident; PCI, percutaneous coronary intervention.

Table 2. Linear Regression Analysis of Independent Variables' Correlation with Postoperative Sexual Quality of Life

Variable	Correlation Coefficient	*P*
General health status	0.23	.008
Preoperative sQoL	0.5	<.001
Quality of provided information	0.32	.027
Sternal pain	−1.27	<.001
ED	−1.72	<.001
Fear of excessive cardiac burden	−0.74	<.001
Patient age	−0.05	.28
EuroSCORE	0.02	.72
Left ventricular ejection fraction	−0.4304	.1782
Duration after surgery	−0.0077	.4667

for inclusion in this study. The inclusion criteria were male sex, age 18 to 60 years, who underwent and survived isolated CABG via median sternotomy. The exclusion criteria were death, loss to follow-up, failure to consent to participation in the study, and failure to deliver the questionnaire data. A total of 734 patients met the inclusion criteria, of whom 296 were lost to follow-up, 21 died, and 15 declined to participate in the study. The remaining 402 patients agreed to participate, gave written informed consent, and received a standardized questionnaire by mail between November 2012 and February 2013. Of the questionnaires that were sent, 265 were returned (66% response rate). The 265 patients who returned the questionnaire made up the study cohort.

Data Collection

Clinical Data. Patient clinical data were collected from the institution's data bank. These data included procedure date, indication for surgery, ejection fraction, extracardiac atherosclerosis, postoperative complications (eg, rethoracotomy, myocardial infarction, renal failure, cerebrovascular incidents, or sternal wound complications), intensive care unit (ICU) stay, and hospital stay.

General Health. Estimation of each patient's perception of his general health was based on self-evaluation using a visual scale from the EuroQoL-5-Dimensions-5-Level (EQ-5D-5L) questionnaire. The higher the score, the better the patient's general health [Hinz 2014].

Evaluation of Patients' Education regarding Sexuality and CABG. Patients were questioned on the following: by whom, in which form, and to what extent they were informed. Multiple choices were provided (family doctor, nursing personnel, hospital physicians, reading material, and face-to-face education). The patient's perception of the quality of information was presented on a scale from 0 (very poor) to 5 (excellent).

sQoL Questionnaire. To further evaluate sexual satisfaction and sexual function, a standardized questionnaire was tailored to optimally describe patient sQoL before and after CABG. The questionnaire blocks were based on the validated EQ-5D-5L score for general health, European Male Aging Study (EMAS) overall sexual functioning (OSF) score for sexual satisfaction and sexual functioning [O'Connor 2008], EMAS sexual functioning distress (SFD) score for distress due to sexual dysfunction [O'Connor 2008], and EMAS erectile dysfunction (ED)/Massachusetts Male Aging Study for ED [O'Connor 2008; Araujo 1998].

General pre- and postoperative sexual satisfaction was evaluated using a single-item scale from 0 (totally unsatisfied) to 10 (totally satisfied). To evaluate sexual activity and anxiety related to sexuality and the operated heart, patients were asked to report if and in which postoperative week they resumed sexual activity. A quantitative evaluation of sexual activity (frequency of intercourse/masturbation per month) was reported. Patients were asked to report the degree of anxiety related to sexual activity after CABG on a scale from 0 (no anxiety) to 5 (very high anxiety). Pain related to sexual activity was reported on a scale from 1 (no pain) to 3 (severe pain).

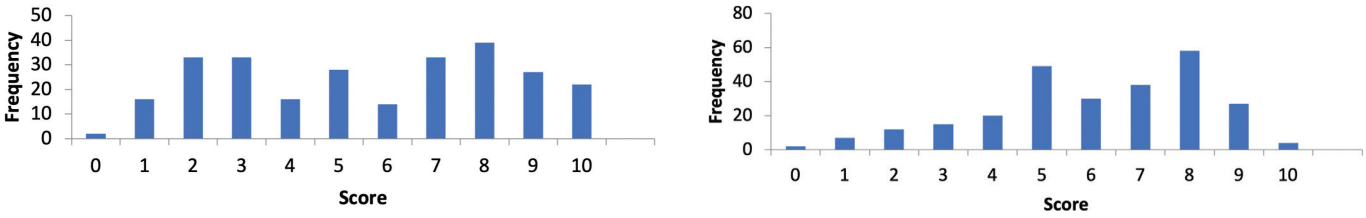

Figure 1. Distribution of general health score. A, Preoperative distribution. B, Postoperative distribution.

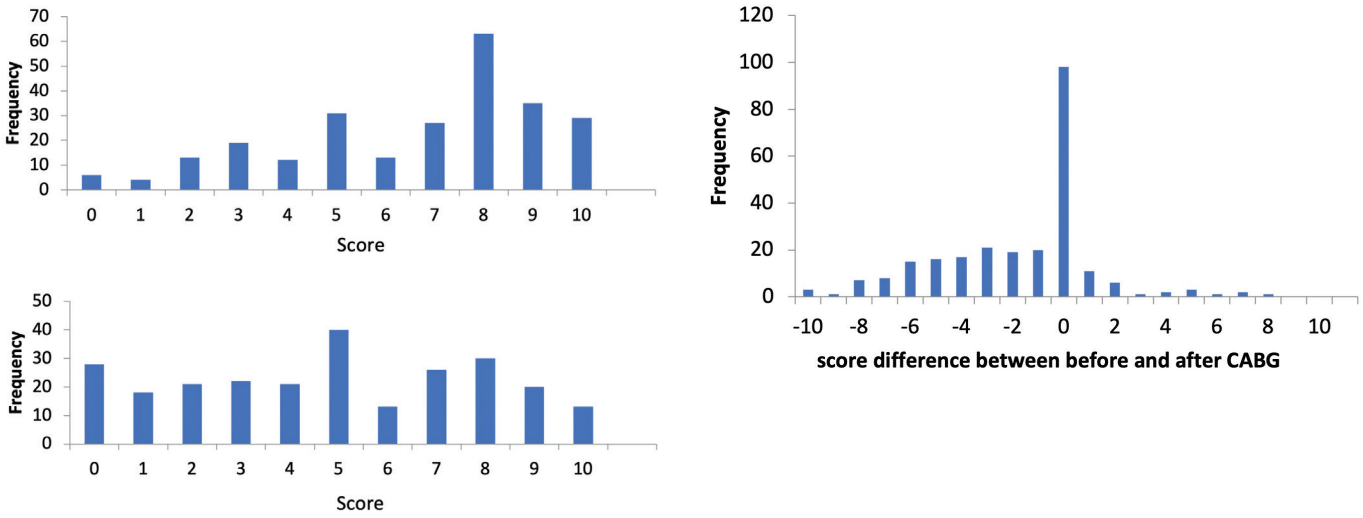

Figure 2. Distribution of sexual quality of life score. A, Preoperative score distribution. B, Postoperative score distribution. C, Distribution of reported difference between preoperative and postoperative score.

Statistical Analysis

Unless otherwise specified, quantitative data are presented as mean ± standard deviation (SD) and qualitative data as percentages (or absolute numbers in case of low percentages). Variables that were not normally distributed are reported as medians with interquartile ranges. A 2-way t test was used for comparison of paired samples. Linear regression analyses were carried out to evaluate the statistical significance of possible risk factors affecting postoperative sQoL. For the t test and regression analysis, the significance level for α was set at 5%, and $P < .05$ was considered statistically significant. All answered questionnaire data were included in the analysis. All statistical analyses were performed using IBM SPSS Statistics for Windows software, version 22.0 (IBM Corp., Armonk, NY).

RESULTS

Clinical Data

Table 1 lists patient demographic and clinical data. The patient cohort comprised patients ages 33 to 60 years, of whom 7% were single and 74% continued to stay with the same spouse at the time of follow-up. Of the patients, 25.7% had reduced left ventricular ejection fraction (30% to 50%), and 5.8% had ejection fraction <30%.

Of the cases, 72.5%, 21.9%, and 5.7% were elective, urgent, and emergency procedures, respectively. Elevated cardiac enzymes or pathological electrocardiogram was documented in 9 patients (3%), 3 of whom underwent an operative revision of CABG, 2 underwent percutaneous coronary interventions, and 4 were treated conservatively. Re-thoracotomy was necessary in 11 (4.2%) patients: 8 for bleeding and 3 for bypass revision. There were no cerebrovascular incidents. Five patients developed sternal wound complications requiring operative treatment. The duration of ICU stay was <24 hours in 68% of the cases, 16.6% stayed for 24 to 48 hours, 7.5% stayed for 48 to 72 hours, and 8% stayed for >72 hours. The follow-up period until conduct of the survey was 41 ± 18 months, median of 43 months, and interquartile range of 25 to 57 months.

General Health

The general health questionnaire showed a wide dispersion of data (Figures 1a and 1b), including a statistically significant improvement after surgery, with a preoperative score of 5.5 ± 2.8 and a postoperative score of 6 ± 2.2 ($P = .01$).

Evaluation of Patients' Education regarding Sexuality and CABG

Most of the patients (83%) reported that sexuality was not mentioned or discussed before surgery. The informed

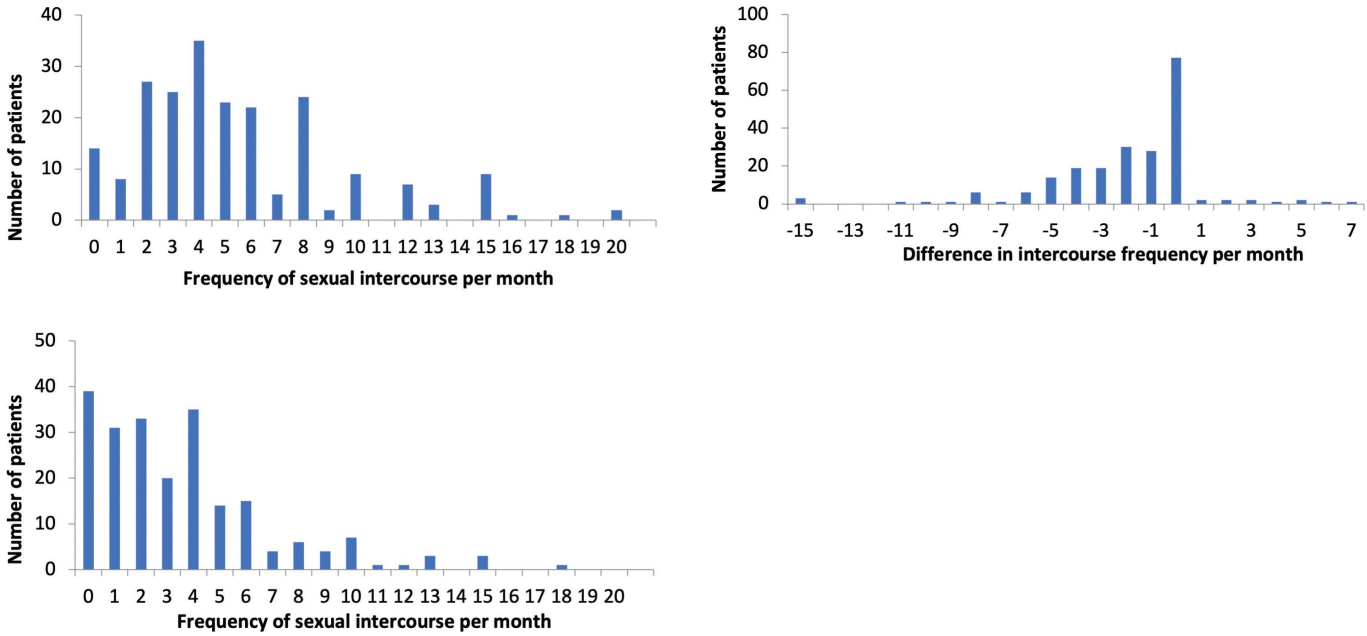

Figure 3. Frequency of sexual intercourse per month. A, Preoperative distribution. B, Postoperative distribution. C, Reported difference between preoperative and postoperative frequency.

patients reported receiving information from different routes: 8 (3%) from family physicians, 17 (6.4%) from hospital physicians, 28 (10.6%) via printed material, and 25 (9.4%) via personal research.

Postoperatively, 77.4% of the patients did not receive any personal or printed information regarding sexuality. The informed patients reported receiving information from different routes: 20 (7.5%) from family physicians, 20 (7.5%) from hospital physicians, 2 from nursing personnel, 32 (12.1%) from printed material, and 42 (15.8%) from personal research. The quality of received information was perceived as very poor, poor, average, good, very good, and excellent by 10%, 10%, 17%, 19%, 25%, and 19% of the patients, respectively.

sQoL questionnaire results

General Sexual Satisfaction before and after Surgery. The score of sexual satisfaction was 6.5 ± 2.6 and 4.7 ± 3.03 pre- and postoperatively, respectively. Of the patients, 37%, 10.8%, and 50.2% reported no change, an improvement, and a decline in postoperative sexual satisfaction, respectively. The decline in sexual satisfaction was statistically significant ($P < .001$) (Figures 2a–2c).

Linear Regression Analysis. The linear regression analysis of independent variables' correlation with postoperative sQoL is shown in Table 2. General health status, preoperative sQoL, and quality of received information correlated positively with postoperative sQoL, whereas sternal pain, ED, and fear of excessive cardiac burden correlated negatively. Patient age, ejection fraction, preoperative European System for Cardiac Operative Risk Evaluation (EuroSCORE), and duration of follow-up did not show significant correlation with postoperative sQoL.

Sexual Intercourse before and after CABG. Figures 3a–3c depict the reported pre- and postoperative frequencies of sexual intercourse and the differences between them. The pre- and postoperative median monthly frequencies of sexual intercourse were 4 [3 to 8] (range 0–20) and 3 [1-5] (range 0–18) times, respectively. Postoperatively, an increase, no change, and a decrease in sexual intercourse frequency were reported by 5.2%, 35.2%, and 59.4% of the patients, respectively. The mean drop in monthly frequency was 1.97 ± 3.2 ($P < .001$). When patients were asked if their personal sexual activity increased or decreased postoperatively, 0.4%, 41%, 32%, 25%, and 1.6% reported no sexual activity at all, a substantial decrease, a slight decrease, no change, and an increase in sexual activity, respectively.

Masturbation before and after CABG. The mean pre- and postoperative monthly masturbation frequencies were 3.5 ± 5 and 2.8 ± 4.2, respectively. The decrease in frequency was statistically significant ($P = .006$).

Fear of sexual intercourse after CABG. Table 3 lists the distribution of patients' reports regarding fear of sexual activity after CABG. Most patients (52%) reported no fear of sexual activity after CABG, 42% reported a sense of fear, and 6% reported having no sexual partner. In 28% of the patients who reported a sense of fear, the partner's fear interfered with sexual activity. Fear of sexual intercourse affected the patient's sQoL severely (4 or 5 on a scale of 0 to 5) in 13% of the cases and moderately (1 to 3) in 36% of the patients, whereas 51% of the patients denied any negative effect on their sexual life.

Erectile Dysfunction after CABG. Of the patients, 12%, 40.5%, 33.8%, and 13.5% reported no ED, mild dysfunction, substantial dysfunction, and complete impotence after CABG, respectively. Regression analysis showed a negative

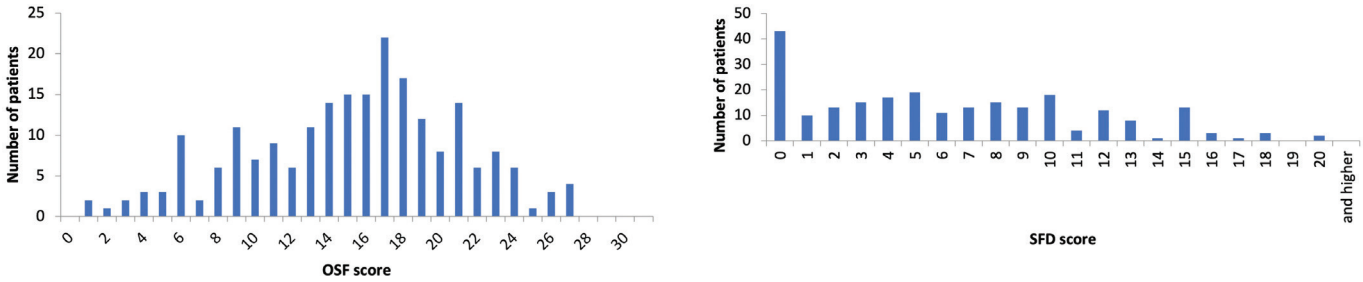

Figure 4. Distribution of postoperative EMAS scores. A, EMAS OSF score. B, EMAS SFD score.

correlation with sQoL, with a correlation coefficient of –1.72 ($P < .001$).

First Orgasm after CABG. The data analysis did not show a normal distribution, with extreme outliers over 29 weeks. The median time to first orgasm after CABG was 6 weeks (interquartile range 3 to 8).

Sternal Pain during Sexual Activity after CABG. Among the patients in this study, 65%, 28%, 4%, and 2.5% reported no pain, light sternal pain, substantial pain, and pain elsewhere during sexual activity after CABG, respectively.

EMAS Functioning Score after CABG. The median EMAS OSF score was 16 (interquartile range 11 to 19) (Figure 4a). The median EMAS SFD score was 5.5 (interquartile range 2 to 10) (Figure 4b).

DISCUSSION

To the best of our knowledge, this is the first study in Germany, and probably central Europe, to analyze the sQoL of patients who underwent CABG. The baseline characteristics of the study cohort were comparable to those of previously published studies [Papadopoulos 1986].

Our patient cohort included relatively young CABG patients whose sQoL, according to Fisher et al [2010], plays a major role in the overall quality of life. Moreover, 77% of the study cohort reported being in a steady relationship, in which sQoL is an integral and important part of quality of life [Fisher 2010]. It is safe to consider this patient cohort to be in a good condition for effective rehabilitation and recovery because of their low operative risk and good postoperative results. Therefore, identification of the pre- and postoperative sexual status of this age group is important, primarily to educate the patients and secondarily to ensure adequate postoperative care, both aiming to improve patient sQoL.

This study revealed a very low quota of informed patients, with 83% and 77% of the patients not receiving any information pre- or postoperatively, respectively. Furthermore, our results showed that the quality of the provided information played an independent role in patients' postoperative sQoL (Table 2). These results concur with the results published by Lai et al [2011], who reported a 53% preoperative quota of correct answers to the study's sexual knowledge questionnaire, with sexual knowledge as an independent factor affecting postoperative sQoL. This confirms the importance of the quality of the patient education provided. Papadopoulos et al [1986] raised a concern that the medical field is not adequately attentive to this problem, and that the problem is not obvious to medical personnel. The paucity of knowledge and studies addressing the topic can be seen both as a reason for and a result of the failure of medical personnel to recognize the problem. The only available recommendation from a scientific body is the scientific statement released by the American Heart Association regarding sexual activity and cardiovascular disease in 2012 [Levine 2012], which can be considered a valuable contribution to the topic. However, further studies are needed, as there are few evidence-based data on sQoL after CABG and no published practical guidelines on patient education pre- or postoperatively.

Because the aim of this study was to evaluate sQoL and sexual activity after CABG, we were also interested in studying the change in sQoL and sexual activity from the preoperative status. The decrease in frequency of sexual activity and patient sexual satisfaction seen postoperatively was confirmed by the EMAS results, which showed a lower OSF and a higher SFD than that of the normal population of the same age and sex group, whose published scores show OSF and SFD scores of 18.4 ± 5.5 and 2.2 ± 3.3, respectively [O'Connor 2008]. An explanation of these results is difficult, but the high SFD might be due to the patients' high expectations after surgery or a lack of information regarding what to expect postoperatively. Further studies examining the effect of adequate preoperative counseling on postoperative SFD are needed to further examine this hypothesis.

The linear regression analyses were aimed at revealing other factors affecting sQoL. The analysis showed that despite the postoperative sQoL being generally lower than before surgery, preoperative sQoL correlated positively with postoperative sQoL. These results concur with those of Sjöland et al [1997]. Understandably, general patient health also correlated positively with postoperative sQoL. However, patient age and EuroSCORE did not show statistical significance, which might be attributed to the selection criteria of the study, as it included young patients who survived the procedure and the follow-up period.

Several factors negatively influenced sQoL. Sternal pain and ED played an understandable negative role. We believe that adequate counseling and therapy may help patients improve their sQoL despite sternotomy; however, ED is multifactorial and difficult to address. The absolute numbers

Table 3. Fear of Sexual Intercourse after CABG

Question and Scale	Percentage
Fear of sexual intercourse after CABG	
0 (no fear)	52.5
1	20.5
2	12.2
3	9.1
4	2.7
5 (maximal fear)	3.0
Sharing fears with partner	
Yes	28.4
No	46.3
I don't know/remember	19.5
I don't have a partner	5.8
Inhibition of sexual life due to fear	
0 (no inhibition)	51.0
1	17.8
2	11.3
3	7.3
4	7.3
5 (massive inhibition)	5.2

reported in this study are similar to the data presented by Papadopoulos et al [1986]; however, further analysis of the data did not confirm the assumption that the ED might be related to postoperative medications. We believe that this point should be directly and adequately addressed with specialist support during the follow-up period.

Fear significantly negatively affected postoperative sQoL—not only the patient's fear, but also that of the partner. These findings are similar to those of Dueñas et al [2012] regarding fear, depression, and quality of life after myocardial infarction and the study by Papadopoulos et al [1986], who reported spouse concerns and a percentage of patients being overprotected by their families. Therefore, we believe that adequate counseling should be provided to patients' partners to ensure successful rehabilitation.

Limitations

This was a retrospective, single-center study. Many operated patients were lost to follow-up, and not all patients filled the questionnaire completely. The patients filled the preoperative questionnaires postoperatively, during the follow-up period, which may have led to inaccuracies or positive bias toward the preoperative phase. A further limitation is the absence of a validated specialized single questionnaire in the literature targeting the problem at hand, with the consequent need for a combination of several standardized questionnaires to ask the required questions as directly as possible. With the developed extensive questionnaire, we opted not to add the 36-Item Short Form Survey or the Hospital Anxiety and Depression Scale–depression subscale to decrease the participation load of the patients and increase the response rate. The developed questionnaire is tailor-made for patients undergoing cardiac surgery and is included in the Supplementary Material—I. We recommend using the developed questionnaire for further studies.

Conclusions

Middle-aged men experience decreased sQoL after CABG. Preoperative sQoL and general health have a significantly positive influence on postoperative sQoL. Sternal pain, fear, and ED play a negative role and should be addressed via standardized education, counseling, and medical treatment. Patient education is severely lacking. Guidelines for pre- and postoperative care are needed to educate and help medical personnel provide needed support. Further studies examining the effect of adequate preoperative counseling on postoperative SFD are needed, and large cohort studies for males and females should be encouraged.

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