

Anxiety Before and after Coronary Artery Bypass Grafting Surgery: Relationship to QOL

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Abstract: This study aimed to examine the presence of anxiety in patients before and after coronary artery bypass grafting surgery (CABG). Additionally, its relationship to patient's quality of life (QOL), because of effects of psychological factors such as anxiety on CABGs outcomes. Comprehensive data on 187 patients who underwent CABGs were prospectively collected in Fatemeh Zahra university hospital in Sari/Iran preoperative and 18 months follow-up anxiety and QOL in functional status were measured using the state portion of the Spielberger State-Trait anxiety inventory (STAI) and Short Form Health Survey (SF-36) questionnaire respectively. State anxiety scores ranged from 23-67 with a mean of 38 ± 9.95 before and 20-65 with a mean of 32 ± 9.40 in 18 months after CABGs. This study demonstrated that most patients (N=108, 57.8 and N=115, 61.5) had low levels of anxiety at both time, respectively. The present study showed significant positive association between pre and postoperative state anxiety ($P=0.000$) and pre and post operative mental health ($P=0.000$). Results showed negative correlations between preoperative mental health and preoperative state anxiety ($p=0.000$), postoperative physical functioning and postoperative state anxiety ($p=0.000$). It was concluded that identifying patients likely to experience anxiety before CABGs and to highlight risk group will enable us to design specific interventions that predominantly focus on reduce patient's anxiety and improving their QOL.

Key words: Anxiety • Coronary artery bypass grafting • Surgery • Quality of life

INTRODUCTION

Anxiety is as a negative emotion that occurs response to perceived threats [1] and May have medical or psychological consequences when it be persisted or severe [2]. Anxiety is considered to be a risk factor for development of coronary heart disease and commonly experience after acute coronary syndrome [3-5] and is specifically associated with cardiac mortality [6, 7] as sudden cardiac death. Nevertheless, it is probably under- diagnosed [8] or little is known [9].

Researchers have found that anxiety may persist throughout the operative course of coronary artery bypass - surgery (CABGs) [10], or after that [3-5]. In variety of studies have shown psychosocial factors play a significant role for predictive of cardiac surgery outcomes [8-12].

In this way in review of literature that anxiety was examined before and after CABGs, the results showed of 142 consecutive patients undergoing CABGs 34.7% were clinically anxious before their operation while 24.7% were anxious afterwards [7]. However, the biggest

reduction may occur from preoperative to early postoperative times [13] or after 6- month - follow up [14]. There is conflicting results. In a review of recent literature, Gallagher *et al.* [15] reported that anxiety level did not change from before to after surgery remaining low to moderate. Furthermore, Chaudhury and *et al.* [16] and Gallo *et al.* [17] have shown significant incidence of anxiety in patients undergoing CABGs before and after surgery. In a study that anxiety was measured at several times after CABGs it was reported that anxiety may be seen significantly at all postoperative time-points [18].

In addition, it is known, patients experiencing level of preoperative distress were more likely to report decrements in several domains of Quality of life (QOL) after their operation [3, 9]. Patients who are more anxious before CABGs have more postoperative pain [19], less physical signs and symptoms [14], risk of death or myocardial infarction (MI), [20], cognitive decline [21] and poorer prognosis [20]. Better QOL was associated with lower anxiety level [22].

Thornton *et al.* [14] concluded, changes in levels of anxiety reflect the mental health and emotional role changes.

To our knowledge there is a paucity of Iranian work have examined the association between anxiety before and med to long term after CABGs and its relationship to patients QOL especially in physical functioning and mental health domains.

MATERIALS AND METHODS

Comprehensive data on 187 patients who underwent CABGs Were prospectively collected at Fatemeh Zahra University Hospital in Sari/ Iran, between August 2005 and August 2008 (they were also part of another investigation by the author). This center provides adult open heart surgery services for population of 3203, 087 inhabitants and for neighbor region with 3974, 118 inhabitants. However, some patients refer or decided to do surgery to capital city that is close to our province more than 400 CABGs procedures performed at our institution during our study.

The study was approved by the ethic committee in research the Mazandaran University of Medical Sciences, potential patients for the study were identified through a daily screening of the admission records, the research nurse carried out the primary interview according to structured research scheme. Each patient gave written informed consent to participate. The patients were screened for study inclusion and exclusion criteria.

Inclusion criteria were included ability to understand Persian, ambulatory before surgery, ability to respond to an interview situation and exclusion criteria included diagnosis of neurological deficits, dementia and emergency CABGs.

Patients who were eligible and having CABGs were administered a face to face interview and by telephone 18 months after CABGs. With regard to inclusion and exclusion criteria, preoperative CABGs and unavailable samples after 18 months, final sample were compared by 187 patients and 179 patients, respectively.

Preoperative and 18 months follow-up anxiety was measured using the state component of the widely used and extensively validated spielberger state - trait anxiety inventory (STAL) [23-27].

The state portion of the STAI is a 20 - item self - administered instrument - designed to measure the presence of anxiety symptoms at the present moment.

Studied participants were asked to indicate on a 4-point likert scale (1 = not at all, 4= very much so) how they felt on day before surgery, also they were asked to answer 18 months after CABGs.

For assessing functioning status domains on QOL in patients, we used physical functioning (PF) and mental health (MH) subscales of the eight total subscales of the 36-item medical outcomes study short form health survey (FS-36). The FS-36 questionnaire has been extensively used to assess QOL in a variety of cardiac populations. Also, validity and reliability of the questionnaire assessed in previous studies [28-32].

Variables are presented as percentage for dichotome variable and as mean \pm SD and range for numerical variables were tested with the t- test and paired t- test was used to compare the anxiety before and 18 months after CABGs.

The relationships between anxiety and QOL were evaluated with P-value < 0.05 was considered statistically significant. Data were analyzed using SPSS software [16].

RESULTS

Average age for male patients was 57.38 and for female 59.37. Most of patients were male (N=104, 55.6%) with a mean of years of education (7.5 \pm 2.31). Also the university degree was found only (N= 4, 2.1%) among patients. Number of patients had first time CABGs was (N=178, 95.2%). Majority of patients had outside jobs (N=89.52%) and comorbidities (N=166, 88.8%). More than of (N=89, 47.6%) had three vessels disease and (N=106, 56.7%) experienced chest pain before CABGs.

Table 1: Mean values, standard deviations and intercorrelations (Pearson's) of the variables included in the study

Scale (mean ± s.d)	1	2	3	4	5	6
1-State anxiety Before CABGs 39.1 ± 9.95	-	-	-	-	-	-
2-State anxiety 18 months after CABGs 32.08 ± 9.46	0.64(0.000)	1.00	-	-	-	-
3-Physical functioning before CABGs 52.84 ± 17.88	NS	NS	1.00	-	-	-
4-Physical functioning 18 month after CABGs 70.32 ± 18.68	NS	-0.4(0.000)	0.28(0.001)	1.00	-	-
5-Mental health before CABGs 56.64 ± 9.44	-0.45(0.000)	-0.39(0.000)	NS	NS	1.00	-
6-Mental health 18 month after CABGs 56.68 ± 10.8	-0.22(0.01)	NS	NS	0.22(0.023)	0.52(0.000)	1.00

Only significant associations are shown. P<0.05 p<0.01

Table 2: Mean and standard deviation of state anxiety score before and 18 months after CABG with different variables included in the study

Variable	State anxiety before Mean±SD	p-value	State anxiety after Mean±SD	p-value
Sex:				
Female	42.90±8.34	0.000	34.68±9.16	0.004
Male	36.20±10.1		30.02±9.23	
Age:				
<54	13.93±2.56	0.57	14.45±2.20	0.66
55-64	14.31±2.18		14.03±2.74	
>65	13.81±2.80		13.99±3.22	
Educational status:				
Illiterate	13.73±2.56	0.033	14.01±2.55	0.079
Primary	13.60±2.52		13.70±3.29	
Secondary (trate)	14.88±2.07		14.54±2.10	
Secondary	15.36±2.08		15.27±1.75	
Tertiary	14.44±2.09		20.00	
Duration of heart Disease:				
1-5	13.84 ± 2.50	0.005	14.03±2.59	0.044
5-10	13.94±2.61		13.42±3.65	
10-13	15.25±1.80		15.56±1.55	
Number of vessels disease:				
1	13.98±2.40	0.71	15.03±1.76	0.24
2	13.77±2.93		14.16±2.67	
3	14.15±2.36		13.93±2.99	
MYHA Class:				
I	14.91±2.25	0.015	14.86±2.18	0.17
II	13.85±2.48		13.99±2.89	
III	14.12±2.75		14.63±2.35	
IV	12.34±2.75		12.61±3.24	

Our study showed most patients (N=103, 55%) were in NYHA II. State anxiety scores ranged from (23-67) with a mean of 38±9.95 before and (20-65) with a mean of 32±9.40 18 month after CABGs.

This study demonstrated most patients (N=108 57.8% and N=115, 61.5%) had low levels of anxiety at both the times, respectively, with significant changes across time (P=0/000).

Table 1 shows Pearson product moment correlations between state anxiety before and 18 months after CABGs, functional status before and after 18 months after CABGs.

As can be observed there is significant positive associations between pre and postoperative state anxiety

also pre and postoperative mental health. Results showed negative associations between preoperative mental health and state anxiety in two times points. The same association was found for physical functioning and state anxiety postoperatively. We could found small positive associations between pre and postoperative physical functioning, also, small negative associations between and preoperative state anxiety post mental health. As shown in Table 2, there is a significant association between sex and state anxiety scores.

There was no evidence of an association among state anxiety and age, education status, duration of heart disease and number of diseased vessels.

DISCUSSION

Given the negative impact of anxiety in cardiac patients, it essential that clinicians accurately determine which patients are anxious and manage them effectively [10].

Mean state anxiety score was 38 ± 9.95 before CABGs while it reduced 18 months after that 32 ± 9.46 . Despite low mean anxiety scores in baselines and 18 months after surgery, there are significant changes from preoperative state anxiety level to postoperative levels. Our findings confirmed the results of previous studies [11, 14].

In study of Thornton *et al.* [14] that anxiety was measured with (HADS), it was also shown change of anxiety scores was significant after the 6- month follow - up.

The decline in anxiety scores from pre to post CABGs points to the fact that patients are under psychic strain before CABG surgery [14]. In this way, Sandau *et al.* [33] believed decline in anxiety may reflect relief from having completed a strenuous operative procedure, Lessening of symptoms and using problem-focused coping strategies greatly, therefore, they return to normal life rapidly [23].

According to present study patients with more preoperative state anxiety had more postoperative state anxiety. The results are in agreement with review studies of Duits and *et al.* [34]. It seems designing and conducting intervention plan to support patients [35], especially before surgery is crucial because patients who were anxious before surgery were more likely to continue to be anxious throughout their recovery [15]. Intervention improves physical and psychological functioning [36] and is warranted in individual patients undergoing CABGs [22] and increases the cost-effectiveness of the procedure [28].

Corresponding to previous studies [8, 28] we found significant positive associations between pre and postoperative mental health score in patient's QOL. Lopenon *et al.* [37] reported despite the later reduction in mental health score after surgery it still remained at a significantly higher level 18 months after surgery in comparison with the time before surgery.

A significant negative correlation was found between preoperative mental health and state anxiety in tow time points. Also, it was reported from Moser [11] psychological factors may have a greater influence that physical factors on QOL after BGs. It was advised many patients have noticeable mental distress before CABGs which has to be recognized and treated. Duits [34]

identified psychological maladjustment before surgery demonstrated by high anxiety and depression and predicted high anxiety and depression scores after surgery. In this way, assessment of anxiety before CABGs can indicate risk group and suggests care proceedings during rehabilitation period in order to improve effectiveness of cardiac grafting [12].

We could found negative associated between postoperative state anxiety and physical functioning. Hunter *et al.* [22] examined anxiety level and quality of life after surgery and reported better quality of life was associated with lower anxiety level. In this study that women and men compared with each others, illustrated women who scored lower on the physical dimensions of quality of life experienced slightly high levels of anxiety.

Consistent with prior research findings, Sandau *et al.* [33] reported, a small negative correlation was observed between preoperative state anxiety with pre and post operative physical functioning. While, Panagopoulos *et al.* [28] identified preoperative distress as an important predictor of QOL after CABGs. In the studies of Sandau *et al.* [33] Rothenhausler *et al.* [38] it was reported that symptoms of anxiety decreased after 3 and 12 months, respectively. However, Welke *et al.* [39] have shown decreasing of anxiety during 12-month was happen during follow up in Patients' who had not experienced chest pain after operation on the other hand there is reason to questions whether it is chest pain that influences of QOL or vice versa.

In congruent with prior research reports [1, 15, 22], in our study women had significantly higher anxiety scores than men preoperatively. It seems this pattern of anxiety in women occurred different cultures scores. Moser [11] also reported anxiety was twice in women than in men and it was emphasized that female gender had poor psychological and physiological functioning status among older adults undergoing CABGs [15]. Sorensen *et al.* [22] reported that female patients were significantly older than male patients and also are less likely to have a partner, so the women are more likely to lack support. It may by important fact that female is vulnerable to critical situations [11, 15]. Although, consistent with published reports by Valentinin *et al.* [40] we did not find a significant relationship between age groups and anxiety pre and 18 months postoperative CABGs.

In contrast with Carbassa and *et al.* [41] that reported the lower the educational level of individuals, the higher the anxiety score in the preoperative CABGs. We found no significant difference between educational levels and

anxiety in pre and post CABG surgery. It is possible our finding was influenced by training plan for different educational levels of patients that is routine in this center.

In the present study, we couldn't find any correlation between duration of coronary heart disease and anxiety pre and post operative CABGs. Our results are consistent with others' literature [40].

In our study anxiety scores reduced from before to 18 months after that. It was also shown higher anxiety before surgery was associated with worse mental health. Identifying patients likely to experience anxiety systems before CABG surgery and to highlight risk group will enable us to design specific interventions that predominantly focus on reduce patients anxiety and improve their QOL.

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