A Comparative Study of Quality of Life in Diabetic and Non-diabetic Patients after Open Heart Surgery

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ABSTRACT

Background and Objectives: Diabetes is an important health problem that threatens patients’ quality of life (QOL). Heart disease is the most common complication of diabetes, and the most prevalent treatment for this disease is open heart surgery. Due to extensive operations of heart surgery and unpredictable effects of these interventions on the quality of life, the present study aimed at comparing the quality of life in diabetic and non-diabetic patients after open heart surgery.

Materials and Methods: This descriptive study was performed on 80 patients (31 diabetic and 49 non-diabetic) who were selected using objective-based sampling. Data were collected using SF-36 and demographic data questionnaires which were completed in 3 steps (before operation, 1 months after operation, and 3 months after operation). Data were analyzed using descriptive and analytic statistics including chi-square, repeated measures design, and the independent and paired t-test.

Findings: Results showed no significant differences between the two groups in the different dimensions of quality of life in the 1 and 3 months after the surgery. But regarding mental health and accomplishing tasks, there was a statistically significant difference (p=0.03) between the two groups three months after surgery.

Conclusion: This study showed that both diabetic and non-diabetic patients benefited from open heart surgery, and it had improved their quality of life. Therefore, more studies are recommended to evaluate the long-term effects of open heart surgery on patients' quality of life.

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Introduction

Diabetes is the most common chronic metabolic disease in human and is a major cause of mortality and disability in many countries [1]. The main cause of mortality and disability in diabetic patients is cardiovascular disease, i.e. the frequency of cardiovascular disease in these patients is three to seven times higher than the non-diabetic patients [2]. Cardiovascular surgeries are common surgeries aiming at improving survival and quality of life of such patients. Increased need and tendency to surgery necessitates special attention to such patients and determination of post-surgery quality of life [3].

Coronary artery bypass graft is a therapeutic methods which creates several challenges for healthcare providers and receiver such as per-surgery stress, pain control after the surgery,
and long hospitalization period [4]. Research showed that diabetic patients generally experience negative consequences such as higher mortality rate, longer intensive care and hospitalization period, wound infection, renal dysfunction, re-hospitalization, poor physical function, and lower quality of life [5]. Herlitz et al. conducted a study in Sweden during 1988-1991 which showed that diabetic patients’ quality of life was lower compared to non-diabetic patients before surgery (p<0.000). After surgery, a significant improvement in quality of life was observed in both groups. Investigations showed that diabetic patients’ quality of life was still lower compared to that of non-diabetic patients (p<0.000) [6].

Other studies, such as the research conducted during 1999-2000 on the effects of coronary artery bypass graft surgery on improvement of that diabetic patients’ quality of life in Finland, showed that diabetic patients’ quality of life considerably improved after surgery (p=0.005), but the difference between diabetic patients’ quality of life and non-diabetic patients’ quality of life was not statistically different (p=0.1) [7]. Generally, issues such as lack of serious investigations and research on the diabetic patients’ quality of life after the coronary artery bypass graft surgery in Iran, and contradictory results of similar research in other countries, and the matter that chronic diseases are directly aligned with healthcare objectives such as providing health and promoting the maximum level for patients, the present research aimed at comparatively investigating the diabetic and non-diabetic patients’ quality of life after open heart surgery.

Material and Methods
This comparatively study was conducted on 80 patient undergone open heart surgery referred to Golestan Hospital of Ahvaz University of Medical Science in 2007 (September-March). Inclusion criteria included: 35-75 years of age, type 2 diabetes, optional surgery, and the type of surgery. Exclusion criteria included: creatinine level higher than 1.4 microequivalents, history of underlying disease such as stroke, COPD, and autoimmune diseases. The sample size was estimated as 80 subjects based on pilot sampling and using sample size formula. The sample was divided into two groups of diabetics (31 subjects) and non-diabetics (49 subjects). A written consent was collected from the participants. The standard SF-36 questionnaire, whose validity and reliability have been confirmed in Iran and abroad, and a questionnaire containing demographic information were used to collect data. The SF-36 questionnaire consists of 8 items regarding general health (6 questions), physical health (10 questions), mental health (6 questions), social activities (2 questions), physical pain (2 questions), the role of physical health in accomplishing tasks (3 questions), and livelihood and joy (3 questions). The Likert scale (excellent, very good, good, relatively bad, bad) was used to evaluate responses with the score range of 1 to 5. Demographic information questionnaire addressed educational level, age, sex, occupation, marital status, residence, hospitalization period, the duration of diabetes, history of smoking and its duration, history of hypertension (systolic pressure higher than 140 mmHg and diastolic pressure higher than 90 mmHg) and its duration, the type of vessel used in surgery, duration of hospitalization in ICU, the duration the cardiovascular disease, and the waiting time for surgery. The questionnaires were completed in three stages (one day prior to the surgery, one month after the surgery, and three month after the surgery) through interviews [9]. Data were analyzed using SPSS 13 and chi-squared, repeated measure design, and independent and paired t-test. P<0.05 was considered significant.
Results

Results show that the mean age of diabetic subjects and non-diabetic subjects were 58.35±9.34 and 58.29±9.60, respectively. The two groups did not have a statistically significant difference regarding age. Regarding education, 30% of the diabetic group and 45% of the non-diabetic group were literate. Duration of disease was 51.13±53.10 month in the diabetic group. Regarding sex, 65% of the diabetic group and 33% of the non-diabetic group were women. Chi-squared test showed a significant difference between the two groups regarding sex (p<0.005), and its confounding effects was eliminated using covariance statistical test. It has to be noted that the participating patients were similar regarding marital status, ICU hospitalization period, the type of vessel used in surgery, and hospitalization period. Chi-squared test did not show a significant difference between the two diabetic and non-diabetic groups. Homogenizing regarding factor, such as duration of hypertension condition and duration of hypercholesterolemia, was also conducted, and t-test did not show a statistically significant difference between the two groups. The findings of the 8 components of the SF-36 questionnaire showed that the baseline condition, one and three months after open heart surgery were not significantly different. The only dimension that showed a statistically significant difference between the two groups after three months was the role of mental health in accomplishing tasks (p<0.03). This component did not have a statistically significant difference in baseline condition and one month after surgery (Table 1).

<table>
<thead>
<tr>
<th>Dimension Group</th>
<th>Physical performance</th>
<th>The role of physical health in accomplishing tasks</th>
<th>The role of mental health in accomplishing tasks</th>
<th>Joy and livelihood</th>
<th>Emotional wellbeing</th>
<th>Social performance</th>
<th>Pain level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline condition</td>
<td>514.52±235.65</td>
<td>154.88±35.5</td>
<td>152.90±125.4</td>
<td>164.52±68.2</td>
<td>243.87±207.01</td>
<td>145.16±71.1</td>
<td>97.74±44.64</td>
</tr>
<tr>
<td>1 month after</td>
<td>541.94±197.94</td>
<td>126.32±51.6</td>
<td>174.19±145.16</td>
<td>218.87±56.1</td>
<td>337.74±75.8</td>
<td>75.81±53.02</td>
<td>102.14±62.9</td>
</tr>
<tr>
<td>3 months after</td>
<td>764.31±170.5</td>
<td>177.67±109.68</td>
<td>290.32±53.8</td>
<td>247.10±44.8</td>
<td>371.61±73.7</td>
<td>135.48±40.6</td>
<td>115.48±73.5</td>
</tr>
</tbody>
</table>

Table 1. Comparison of mean and standard deviation of mental and physical dimensions of life quality in the baseline condition, one month after surgery, and three months after surgery

Independent t-test (*p<0.05 significance level)

Discussion
Results showed that the physical performance, joy and livelihood, and pain level were improved three months after surgery in both diabetic and non-diabetic groups. This was extracted using repeated measure design (p=0.001) and had a significant difference. However, no significant difference was observed in physical health dimension in accomplishing tasks, while the physical dimension mean showed no significant difference between one and three months after surgery. Regarding quality of life scales, no significant difference was observed except in the emotional dimension (p<0.005) which was consistent with Jarvinen’s study in Finland.

The results of the mental dimension showed no significant difference in emotional wellbeing, social performance, and general health one month after surgery, but they were significantly different three months after surgery. Herlitz suggested that the quality of life in mental dimension improved in both groups three month after the surgery, however, it was not statistically significant (p=0.07) [6] which is consistent with the present study.

Lee and Ballan did not observe a difference in quality of life in terms of mental condition pre- and post-surgery. However, general health, which is a dimension of mental health, improved significantly after surgery (p<0.001) [10] which is inconsistent with the present study. The inconsistency is due to the type of the study, i.e. diabetic and non-diabetic patients were studied here, but Lee and Ballan studied only non-diabetic patients.

**Conclusion**

Results showed that the score of quality of life did not have a statistically significant difference in diabetic and non-diabetic groups. Open heart surgery is an effective intervention as a therapeutic tool for cardiovascular patients and can improve patients’ quality of life meaning that both groups’ quality of life improved one month after the surgery and three months after the surgery. Understanding the diabetic patients’ quality of life after surgery can help improve their quality of life and solve their problems through establishing educational, therapeutic, and supportive facilities. Since one of the limitations of the present study was the short period of surgery follow-up, it is recommended that further studies be conducted to investigate the long-term effects of open heart surgery on patients’ quality of life.

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