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Quality of Life of the Elderly after Hip Fracture Surgery: A Case-Control Study

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ABSTRACT

Introduction: Hip fracture is common in the elderly. However, the quality of life of the elderly after hip fracture surgery has been largely ignored. Therefore, this study was conducted to compare the quality of life of the elderly with and without history of hip fracture surgery. ***Methods:*** In a case-control study, 70 individuals with a history of hip fracture surgery at least three months before the study (case group) were compared with 70 elderly with the same specifications except the history of hip fracture (control group). The five-dimensional instrument of Euro Qol (EQ5D) was used to collect data. Chi-square test, t-test, analysis of variance (ANOVA) and calculating the odds ratio were used for data analysis. ***Results:*** Compared to the control group, mobility, pain/discomfort, anxiety/depression, health status, self-care, and level of activity were lower in patients with the history of hip fracture. The mean scores of quality of life were also significantly lower in the case group regardless of all demographic variables such as age, sex, living arrangements, income, marriage, level of education, and job. ***Conclusion:*** The chance of undesirable quality of life in patients with a history of hip fracture surgery was 9.17 times greater than the elderly without a similar history. Therefore, developing supportive systems and rehabilitation facilities may improve patients' quality of life.

Introduction

Hip fracture is one of the most important problems that can considerably affect the elderly's life. These fractures lead to increased dependence,[1] disability and mortality.[2] They also create major challenges for the patients, and their families, and the health system.[3] Accidents such as falling are very common among the elderly and are the most important cause of hip fractures among this group.[2]

For the year 2000, about 1.6 million hip fractures occurred worldwide. This number is predicted to be increased by 310% and 240% in men and women by the year 2050.[4] The average ages of hip fracture among females and males are 77 and 72 years old, respectively. Moreover, the rate of hip fracture doubles after the fifth decade of life.[2,5] A study on epidemiology of hip fracture in Iran reported that the crude annual incidence of hip fracture (per 100,000 person-years) was about 115.2 in men and 115.6 in women.[6] However, another study suggested higher rates.[2]

Quality of life (QOL) has been defined as the perceived difference between what the conditions of life is and what they should be.[7] It is a patient-reported outcome usually measured with carefully designed and validated instruments such as questionnaires or semi-structured interview schedules.[8] Today, with increased life length and expectancy,[9] the QOL of the elderly,

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especially those suffering from hip fractures, has received considerable attention.[10] However, the majority of studies in this regard have been conducted in Europe and the QOL of Iranian patients has not been taken into account.

A recent study used three QOL questionnaires and suggested that patients with hip fracture had significantly lower QOL than others.[11] Two other studies used the five-dimensional instrument of Euro Qol (EQ5D) or the Short Form Health Survey (SF-36) Questionnaire and reported the same results.[3,12] According to a similar study, one year after hip fracture, only 29% of patients who rehabilitated and 9% of patients who received conventional care considered themselves fully recovered.[13] There have also been reports about malnutrition, weight loss, disability, and malfunction in individuals with a hip fracture.[14]

To the best of our knowledge, no previous Iranian study has compared the QOL of the elderly with and without hip fractures. According to the fact that the QOL is a mental concept and is affected by environmental, cultural, and supportive services, the present study aimed to compare the QOL of a group of Iranian elderly after hip fracture surgery with a control group without a similar history.

Materials and methods

This case-control study examined the QOL of the elderly who had hip fracture surgery during 2009 and compared the results with the elderly without a similar history. In order to calculate the sample size, information about the number of patients were collected from hospital archives in Kashan, Iran. A previous study reported 114 cases of hip fracture in orthopedic units of Kashan during a three-year period.[15] From the total 114 operated patients, some died, a number immigrated and were not available, and some were not willing to participate. Therefore, the 70 patients over 60 years of age that were available, consented to participate, and could answer the questions were selected as the case group. Afterward, 70 people were selected as the control group based on a 1:1 case to control ratio.

As the tissues around the hip prostheses take at least three months to heal,[16] individuals in the case group had had hip fracture surgery at least three months prior to the beginning of the study. The control group included persons with the same specifications except the history of hip fracture.

Contact information of the patients were extracted from their records in hospital archives. They were then called and asked to refer if they accepted to participate. The control group was selected from the elderly who lived in the same neighborhood or from the participants' relatives with age difference of ± 3 years. The controls were the same sex as the cases.

The participants were explained about the objectives of the study and how to fill the questionnaires. They then received the questionnaires. The questions were read to illiterate subjects by the researcher and their answers were recorded in the questionnaire.

The questionnaire included two parts. The first part covered personal specifications such as age, gender, living arrangements, current job, education, marital status, income, and having chronic diseases. The second part was the EQ5D.

EQ5D generally examines the health-related QOL. It has been found as a good tool for studying the QOL after hip fracture. It evaluates five domains of mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. Each item is scored as 100 (no problem), 50 (moderate problem) and zero (major problem). Therefore, higher scores correspond better QOL. EQ5D also includes a health ranking diagram on which the individual marks his/her current health status as a number between zero and 100. The reliability and validity of this questionnaire have been examined in different studies and

reported as 0.77-0.88 for different domains.[17] The Cohen coefficient in test-retest of this questionnaire has also been calculated as 0.61-1.00 for its different parts.[18]

Data analysis was performed using chi-square test, t-test, and analysis of variance, and calculating odds ratios (OR) in SPSS for Windows 11.5 (SPSS Inc., Chicago, IL, USA). QOL scores of 50 or less were considered as undesirable. Apparently, scores above 51 showed desirable QOL.

Ethical considerations

This study was approved by the institutional review board and the research ethics committee of Kashan University of Medical Sciences (Kashan, Iran). We followed the recommendations of Declaration of Helsinki. Moreover, all individuals signed informed consent forms before participation.

Results

In this study 140 people, including 79 females and 61 males, were examined. The mean (SD) ages of the case and control groups were 73.50 (8.07) and 72.80 (7.48) years, respectively.

The mean scores of all five domains and overall QOL of the case group were significantly lower than the control group. The greatest differences between the two groups were observed in the two domains of self-care and performing usual activities (Table 1).

In the case group, no significant relations were observed between the QOL mean scores and individual characteristics. However, cases and controls with similar personal characteristics had significantly different mean scores of QOL (Table 2).

In total, 21.4% (15 subjects) of the case group and 71.4% (50 subjects) of the control group had desirable QOL ($X^2 = 35.18$; $p < 0.001$; OR = 9.17; 95% confidence interval: 4.24-19.82).

Discussion

The results of this study showed that all domains of QOL, particularly self-care and usual activities, of the elderly with a history of hip fracture surgery was significantly lower than those without a similar history. In addition, the calculated OR showed that the chance of an undesirable QOL in patients with the history of hip fracture surgery was 9.17 times higher than others.

Adachi et al.[11] and Hagino et al.[19] performed similar studies and reported that the fracture of hip considerably decreases all dimensions of QOL, especially physical and social functions. A recent study suggested that people with a history of hip fracture faced with a considerable decrease in QOL one year after fracture that remained nearly unchanged at two-year follow-up.[20] Such a negative impact on QOL may be attributed to the shortcomings of supportive care and follow-ups after the surgery, the effects of the disease, the length of hospital stay, and high fees of treatment and rehabilitation after hip fracture.

In the current study, although the mean scores of QOL were at average level in both sexes of the control group, females scored less than males. Similarly,

Table 1. Mean scores of different domains of quality of life in elderly with a history of hip fracture surgery (case group) and those without a similar history (control group)

Domains of quality of life	Case group (n = 70)	Control group (n = 70)	Difference (95% CI)†	P
Mobility	39.35 (26.67)	63.57 (26.81)	-24.21 (-33.15, -15.27)	0.001
Self-care	40.71 (29.84)	77.14 (27.82)	-36.42 (-46.07, -26.78)	0.001
Usual activities	36.42 (28.13)	67.85 (33.00)	-31.42 (-41.67, -21.17)	0.001
Pain/discomfort	42.14 (18.32)	54.28 (29.17)	-12.14 (-20.28, -4.00)	0.004
Anxiety/depression	55.71 (28.92)	69.28 (36.40)	-13.57 (-24.56, -2.58)	0.016
Health status	47.14 (13.31)	61.14 (20.03)	-14.00 (-19.68, -8.31)	0.001
Total quality of life	43.58 (15.76)	65.54 (20.90)	-21.96 (-28.15, -15.77)	0.001

Values are expressed as mean (SD), †Confidence interval

Table 2. Quality of life scores of the elderly with a history of hip fracture surgery (case group) and those without a similar history (control group)

Variable	Quality of life score		
	Case group	Control group	P
Sex			
Male	43.12 (17.42)	68.44 (23.72)	0.001
Female	43.95 (14.53)	63.38 (18.53)	0.001
P	0.820	0.310	-
Age (years)			
60-70	44.89 (14.70)	74.08 (20.16)	0.001
71-80	42.31 (17.94)	62.97 (20.45)	0.001
Over 80	43.21 (14.17)	49.92 (13.00)	0.250
P	0.820	0.003	-
Living arrangements			
Alone	40.89 (12.40)	53.23 (12.71)	0.030
With spouse	46.85 (16.26)	68.69 (22.30)	0.001
With spouse and children	43.81 (18.73)	66.06 (21.87)	0.001
With children only	39.84 (16.59)	65.92 (18.71)	0.001
P	0.440	0.340	-
Income			
Low	41.68 (15.50)	63.89 (24.51)	0.001
Moderate	49.0 (15.59)	65.96 (17.14)	0.001
High	33.28 (0.00)	71.53 (23.40)	0.001
P	0.130	0.710	-
Marital status			
Married	44.98 (16.92)	68.71 (21.99)	0.001
Single or widowed	42.41 (12.45)	56.12 (14.15)	0.004
P	0.670	0.330	-
Education level			
Illiterate	43.41 (16.23)	63.39 (19.73)	0.001
Primary school	43.19 (14.05)	77.58 (24.57)	0.001
High school or higher	50.00 (0.00)	58.33 (0.00)	0.001
P	0.950	0.110	-
Current job			
Unemployed or retried	39.90 (16.50)	63.90 (19.73)	0.001
Manual worker	66.67 (0.00)	69.55 (27.04)	0.920
Housewife	51.46 (9.30)	65.43 (19.75)	0.005
P	0.006	0.860	-
Number of chronic disorders			
One	40.94 (2.39)	65.00 (4.12)	0.001
Two	46.85 (3.08)	63.81 (4.54)	0.001
Three	-	44.44 (5.70)	-
P	0.390	0.030	-

Values are expressed as mean (SD)

Nejati and Ashayeri[21] and Orfila et al.[22] reported higher scores of QOL in male controls. In the case group on the other hand, the mean scores of QOL were undesirable in both sexes. Lower scores of the case group showed that having the history of hip fracture can negatively affect the QOL of the elderly regardless of sex. To our surprise, aging above 80 years old obviously decreased the mean scores of QOL in the control group and neared the scores of the two groups. Therefore, apart from any diseases, QOL is very sensitive to age, especially after the eighth decade of life. Previous studies have also reported aging as one of the factors affecting the QOL.[23,24] According to Adib-Hajbaghery, aging increases disabilities of the elderly and thus decreases their QOL.[25]

In both groups of the current study, the lowest QOL score was achieved by the elderly who lived alone. Also the married in both groups got higher mean scores for their QOL. Orfila et al. and Jakobsson and Hallberg have also reported that the elderly who live alone face the reduction in QOL.[22,26] Rana et al. and Shoaib et al. have also reported that having familial relationships and inter-generation supports improves the quality of life of the elderly.[27,28] It seems that developing social and familial relationships with the reduction of stress and depression and also increase of cognitive ability of the elderly, improves their quality of life.

In the current study, although the higher income in control group accompanied higher scores but in the case group this was not observed. This result was not in agreement with other studies and needs more investigations. Arendt had reported that the low-income elderly have lower functional ability and life quality.[29] Non-significance of the relationship of the quality of life and income in the present study may be due to the low number of samples with high income. On the other hand, it seems that the history of hip fracture, apart from income, may considerably decrease the quality of life.

QOL and level of education were not significantly related in either of our groups. While in the case group, individuals with higher education had the highest score of QOL, such subjects had the lowest scores of QOL in the control group. The higher QOL score of educated people in the case group may be attributed to their better trainability.[30] The lower score of educated people in the control group might have been a result of their higher expectations[31] which is negatively influenced by aging. However, it should be considered that the number of participants with high school and higher education in the present study was limited.

We found that in both groups, the elderly who were in employment had higher QOL scores. It seems that employment could positively affect QOL of the elderly by delaying aging-related disability, preserving physical and cognitive abilities, and keeping them socially active.[32] Previous studies have also reported that keeping an employment after retirement can improve the QOL, delay aging-related disability, and increase the elderly life satisfaction.[33,34] In contrast, not being able to work and financial problems will be followed by dissatisfaction of life and feeling of disability among the elderly.[35,36]

In the control group of the present study, having more chronic disorders was associated with lower mean scores of QOL. However, such an association was not observed in the case group. It seems that having a history of hip fracture affects the QOL regardless of other chronic disorders. On the other hand, Orfila et al.,[22] Adib-Hajbaghery[32] and Fierens and Broos[36] suggested that having chronic diseases, especially suffering from multiple simultaneous disorders like arthritis, back pain, diabetes, depression, and heart disease, is related with increased disability and decreased QOL in the elderly.

Conclusion

The mean scores of QOL of the elderly with a history of hip fracture surgery was considerably lower than those without a similar history. Our study showed that the chance of undesirable QOL in patients with a history of hip fracture surgery was 9.17 times greater than others.

Therefore, it is important to prevent hip fracture. Encouraging exercise and preventing falls in the elderly may reduce the incidence of hip fractures. In addition, establishing supportive systems and rehabilitation programs after hip fracture surgery can improve the QOL of the elderly.

The present study used a case control design and each subject was thus assessed only once. A longitudinal cohort study may be beneficial in evaluating the trend of QOL after hip fracture surgeries. Moreover, all of our patients were treated in one center.

Hence, conducting a multicenter study may reveal the effects of various types of treatments and postoperative care on patients' QOL.

Ethical issues

None to declare.

Conflict of interest

None to declare.

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