

Quality-of-Life among Elderly with Untreated Fracture of Neck of Femur: A Community Based Study from Southern India

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ABSTRACT

Background and Objectives: Owing to the high prevalence of osteoporosis and falls, elderly people are at risk of developing hip fractures. The objective of the current study is to assess the quality-of-life (QOL) of elderly (>60 years) with untreated hip fractures in a rural developmental block in Southern India. **Methodology:** Twenty-one elderly with an untreated fracture neck of femur were identified with the help of community level health workers. EuroQol (EQ-5D) was administered to assess the QOL before and after the event. QOL was also assessed among a comparison group, matched for age and sex among neighborhood people. Wilcoxon signed rank test and Mann-Whitney U test were used to compare EQ-5D mean scores with before the event scores and the comparison group scores respectively. **Results:** Of people with hip fracture, 57.1% (12/21), 76.2% (16/21), 81% (17/21), 52.6% (11/21) and 85.7% (18/21) reported severe problems with mobility, pain, usual activity, self-care and anxiety respectively. The EQ-5D mean score among the elderly with fracture neck of the femur was 0.08 (SD 0.27). It was low when compared with the same subjects before the occurrence of the event ($Z = -4.05, P < 0.001$) and as compared with the comparison group ($Z = -5.77, P < 0.001$). **Conclusion:** The QOL scores assessed using EQ-5D index scores was poor among people with untreated fracture neck of the femur as compared with the comparison group and also as compared to their status before the occurrence of the event. A vast majority of study participants reported severe problems with mobility, pain, usual activity and self-care and anxiety domains of EQ-5D questionnaire.

Keywords: Elderly, EuroQol-5D, fracture neck of femur, quality-of-life

Background

A projected increase in the number of the elderly population in developing countries is a subject of growing concern for public policy. Due to high prevalence of osteoporosis and falls, elderly people are at risk of developing hip fractures.^[1-3] Hip fracture is an established health problem in the west and is increasingly recognized as a growing problem in Asia.^[4] The incidence of hip fracture is on the rise and is estimated to reach more than 6 million by 2050.^[5] This will pose a major challenge to the health-care system and society. Unfortunately, no studies, other than projections, are available from India regarding hip fracture incidence. With the demographic transition, it is projected that, there will be a sharp rise in hip fractures over the next few decades in India.^[5]

Studies have shown impairment in the quality-of-life (QOL) in elderly subjects with a hip fracture in both the physical and psychosocial domains.^[6-10] One out of two of previously independent people become partly dependent and a third became totally dependent after hip fracture.^[11] The effects of hip fractures on the activities of daily life and QOL can be even more devastating in elderly individuals, who live in adverse environmental and poor socio-economic conditions.

EuroQol (EQ-5D) and short form-36 are instruments that seem to capture changes in the domains of physical, psychological and social functioning after a displaced femoral neck fracture in the elderly patient and are widely used in various studies.^[12,13] In view of the previously documented higher completion rates and higher responsiveness, EQ-5D is preferred in elderly subjects.^[14,15] The EQ-5D was validated in prospective studies and it appeared to be an appropriate QOL instrument in elderly patients with

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femoral neck fractures.^[16] Studies have shown a good correlation between the EQ-5D scores and other outcome measures such as pain, mobility and independence in activities of daily living.^[17]

There are limited community based studies evaluating the QOL after a femoral neck fracture in India. The objective of the current study was to assess the QOL of elderly (>60 years) with untreated hip fractures in a rural developmental block in Southern India. The effort to describe the QOL in people with untreated hip fracture provides a more holistic approach to the measurement of health. Identifying the unmet needs and focusing on the QOL will aid health care providers and policy makers to propose targeted interventions to improve the QOL and health outcomes among elderly with fracture neck of femur.

Methodology

The community health and development program of the Community Health Department of a Medical College has been providing primary health-care to a population of over 100,000, spread out in the 82 villages of a rural developmental block of Vellore District in Tamil Nadu. The health tier system consists of part time community health workers under the supervision of the health aides (HA), who are trained health workers staying in the villages and are supervised by the community health nurses and a doctor. Reporting of morbidity and mortality is done by HAs, who collect information through home visits, record it in appropriate registers and pass it on to the public health nurse. This information is verified and maintained as an electronic database in the health information system of the department.^[18]

Information on all elderly (>60 years) with a history of acute onset hip pain and inability to weight bear on the same side within the past 5 years was obtained with the help of HAs. Those who had shortening of the leg and adduction deformity and external rotation at the hip joint or had an X-ray showing discontinuity of bony cortex at the neck of femur, degree of mismatch of the trabecular lines in femur head and neck and supra-acetabular part of pelvis, were included in the study. Those who had prior interventions such as internal fixation or surgery, prior lower limb weakness or shortening of the leg and adduction deformity and internal rotation at the hip joint or painless movements at the hip joint or an X-ray showing continuous femoral cortex and those who had severe cognitive impairment as assessed by a score less than six in abbreviated mental test were excluded.

Home visits were done and data was collected using a standard questionnaire by interviewing those who are eligible to be included in the study. The questionnaire had three components-(i) A demographic component; (ii) Details of disease and treatment; (iii) First part of EQ-5D questionnaire. The EQ-5D has five dimensions: Mobility, self-care, usual activities, pain/discomfort and anxiety/depression. Each dimension is divided into 3° of severity: No problem, some problems and major problems. It represent valuations attached to each health state on a continuum between zero and one; zero being dead and one the best possible

health state, although some health states are regarded as being worse than death and have negative valuations.^[19]

The QOL before the occurrence of the event was also assessed by using EQ-5D based on recall by the participants. People from the next nearby house with similar age (± 5 years) and gender were selected as the comparison group, for whom also the entire panel of tests and QOL assessment was done.

The present EQ-5D score and scores before the onset of fracture were compared using Wilcoxon signed rank test. The mean QOL scores of those with hip fracture were compared with the comparison group using Mann-Whitney U test.

Results

QOL scores were assessed in 21 elderly people with fracture neck of the femur and 21 age and sex matched neighborhood comparison group. Mean age in those with a fracture neck of the femur was 76.05 years (SD 11.45) while that in the comparison group was 72.33 years (SD 10.81). With regard to the Socio Economic Status (SES), 47.6% (10/21) and 33.3% (11/21) in the study and control groups ($P 0.26$) belonged to the low SES respectively. There were 4 males and 17 females in both groups. The proportion of illiterate was 42.9% (9/21) in both groups. Among the participants, 61.9% (13/21) of cases and 71.4% (15/21) of the comparison group had associated comorbidities such as diabetes, hypertension, low vision and rheumatoid arthritis ($P 0.37$). The demographic characteristics of the study participants are shown in Table 1.

Among the cases, 57.1% (12/21) had the duration since the occurrence of the event less than 1 year. The major reasons for not taking invasive treatment included financial constraints 42.8% (9/21), not having an attending caretaker 23.8% (5/21), fear about the procedure 23.8% (5/21) and treatment from a traditional healer 9.5% (2/21).

Descriptive analysis of the domains of EQ-5D scoring was done for the study participants. Of people with hip fracture, 57.1% (12/21), 76.2% (16/21), 81% (17/21), 52.6% (11/21) and 85.7% (18/21) reported severe problems with mobility, pain, usual activity, self-care and anxiety respectively [Table 2].

The EQ-5D mean score among the elderly with fracture neck of the femur was 0.08 (SD 0.27). The scores ranged from (-0.145) to 0.706 with a median of (-0.006). It was compared with the EQ-5D score of same subjects before the occurrence of the event (mean score 0.971, SD 0.08) using the Wilcoxon signed rank test. The difference in mean scores was found to be statistically significant ($Z -4.05, P < 0.001$) [Table 3].

The mean EQ-5D scores of the comparison group was 0.96 (SD 0.07). The EQ-5D scores of those with untreated fracture neck of the femur was compared with scores of the comparison group using Mann-Whitney U test and the difference was found to be statistically significant ($Z -5.77 P < 0.001$) [Table 4].

Table 1: Demographic characteristics of the study subjects

Characteristics	Categories	People with fracture(N=21)	Comparison group (N=21)	χ^2 , P-value
Age (%)	<74 years	11 (52.4)	13 (61.9)	0.378
	\geq 75 years	10 (47.6)	8 (38.8)	
Gender (%)	Male	4 (19)	4 (19)	0.652
	Female	17(81)	17 (81)	
Literacy (%)	Illiterate	9 (42.9)	9 (42.9)	0.622
	Literate	12 (57.1)	12 (57.1)	
Socio-economic status	Low	10 (47.6)	11 (33.3)	0.265
	Middle/high	7 (52.4)	14 (66.7)	
Co-morbidities	Present	13 (61.9)	15 (71.4)	0.372
	Absent	8 (38.1)	6 (28.6)	

Table 2: Response by study participants with fracture neck of femur to the various domains of EQ-5D (N=21)

Degree of severity	Mobility (%)	Pain/discomfort (%)	Usual activity (%)	Self-care (%)	Anxiety/depression (%)
No problem	0	1 (4.8)	1 (4.8)	0	0
Some problem	9 (42.9)	4 (19)	3 (14.3)	10 (47.4)	3 (14.3)
Severe problem	12 (57.1)	16 (76.2)	17 (81)	11 (52.6)	18 (85.7)

EQ-5D: EuroQol

Table 3: Comparison of mean EQ-5D scores before and after fracture neck of femur using wilcoxon signed rank test (N=21)

Characteristics	N	Minimum	Maximum	Mean (SD)	Z score	P value
EQ-5D index score before the event	21	0.719	1.000	0.971 (0.08)	-4.053	<0.001
EQ-5D index score present	21	-0.145	0.706	0.081 (0.27)		

EQ-5D: EuroQol

Table 4: Comparison of EQ-5D scores among people with fracture neck of femur and the comparison group using mann-whitney U test

Characteristics	N	Mean rank	Sum of ranks	Z score	P value
EQ-5D index score in people with fracture neck of femur	21	11	231	-5.77	<0.001
EQ-5D index score in the comparison group	21	32	672		

Discussion

Health being “a state of complete physical, mental and social well-being,” measurement of health should also include an estimation of the well-being of the people and not only disease frequency or severity. This concept is very important especially in diseases such as hip fracture, where the disease has marked influence on the person’s way of living, goals, expectations, standards and concerns.

The study aimed to look at the QOL among elderly people with untreated fracture neck of the femur in a rural developmental block. The QOL scores assessed using EQ-5D index scores was poor among people with untreated fracture neck of the femur as compared with the comparison group. The QOL scores were poor as compared with their status before the occurrence of the event also. The findings are consistent with results of other similar studies.^[20] A vast majority of study participants reported severe problems with mobility, pain, usual activity, self-care and anxiety domains of EQ-5D questionnaire.

Many studies have showed that interventions like internal fixation or replacement are associated with better health-related QOL

in patients with femoral neck fracture.^[9] Findings from various studies indicate that an interventional rehabilitation program may improve health related QOL in patients with femoral neck fracture.^[21] However many elderly with hip fracture in the study did not receive any of those treatments due to financial constraints. Both private-sector and public sector institutions will have to come forward to meet the needs of elderly generations. The social security systems and health-care plans must be formulated and implemented realistically and sensibly for the well-being of the older people in India.

Elderly people who manage alone before the fracture might afterward need assistance including both practical help and community care. An interdisciplinary approach is required to improve their functioning in everyday life, which would also include a focus on patient reported outcomes such as QOL. The results of the study warrant implementation of patient-reported outcomes in daily clinical practice and thereby get the patient’s perspective.

The primary health-care team has to play an important role in primary prevention, post-acute care and secondary prevention

of hip fracture among elderly. The primary care team would have to diagnose the problem at the periphery, refer them promptly, encourage them to seek evidenced based remedies, undertake regular reviews to encourage adherence and persistence with therapy and referring back into secondary care if needed. There should be increased understanding among the primary health-care team regarding the primary and secondary prevention of fractures in elderly. Efforts are needed for establishing a patient care model, which is based on functional patient needs, uncovering and treatment of comorbidities including osteoporosis; and return of the patient to the highest possible functional level after hip fracture.

To the best of our knowledge, this study is the first community based study from India to assess the effects on the QOL among elderly people with hip fracture. The study is limited by its small sample size. There is a possibility of selection bias by including the cases identified by the health worker as those with good QOL would not have come to their notice at all. Ideal comparison group should have been those who had interventions following a fracture neck of femur. However, it was difficult to assemble such a group in a community based study. The EQ-5D visual analog scale was not used in the study. The results of the study could have been biased by the recall and reporting by the participants. In order to reduce the interference of other factors on the quality of the results, subjects with severe cognitive deficit were excluded.

Specific QOL instruments aimed at the elderly can yield more meaningful data concerning the degree of compromise in physical function. Unfortunately, a validated specific QOL instrument in the elderly is not yet available for use in the Indian population.

Despite the limitations indicated, this study has clinical and public health implications. The findings of this study highlight the importance of disease and trauma prevention in elderly, early and targeted rehabilitation efforts to increase function and thereby coping after the fracture. The negative impact on the QOL observed in the study subjects can guide programs for the rehabilitation and health-care of elderly people with a hip fracture. Family caretakers and health workers must recognize the physical and psychosocial repercussions on the elderly with a hip fracture. Universalization of primary care with affordable and accessible referral facilities should have to be ensured. Longitudinal studies with a longer follow-up time, along with generic and specific use of instruments for the elderly, are needed to evaluate the impact of hip fractures on the QOL.

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