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Original Article

Is depression associated with functional recovery after hip fracture in the elderly?



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ABSTRACT

Aim: The aim of this study was to examine the effects of depression on functional healing and the return to pre-fracture daily activities in elderly patients with a hip fracture.

Methods: The study comprised 104 elderly patients, who had a unilateral hip fracture between 2009 and 2012. To evaluate daily activities and functional healing of the cases, the study was designed as a prospective comparative study.

Results: The analysis results revealed that the change in the mean ADL scores was related to depression at a statistically significant level ($p = 0.000$).

Discussion: This study results showed that depression had a negative effect on the daily activity level of these cases.

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1. Introduction

As a result of developments in the medical field, there is an increasing elderly population in society. Together with increasing age, an increase in hip fractures is inevitable.¹ Hip fractures in individuals aged 65 years and over have increasing major medical problems of evident morbidity, functional disability and even mortality.^{2–4} Despite all the

developments in current surgery, anaesthesia techniques, postoperative care and rehabilitation, the mortality rate in the first year after a fracture has been reported as 14%–36%.^{2–5}

The most important aim in the treatment of hip fractures in elderly patients is to provide mobilization in the shortest time and to regain the functionality of the pre-fracture period. However, compared with the pre-fracture period, 55%–75% of cases experience a loss of some activities in their daily life.^{2–6} In studies during the treatment process, however much

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emphasis has been put on risk factors related to physical comorbidities of the majority of hip fractures such as diabetes, hypertension and chronic obstructive pulmonary diseases, there has not been a reduced value recorded in practical life in morbidity and mortality rates. Therefore, a need has been identified in recent studies to include psychological health and social factors in addition to providing physical integrity in the treatment process.⁷⁻⁸

Although it is ignored in the majority of elderly patients, depression is the most common psychological disorder as a co-morbidity of hip fracture.⁹ However, in the treatment process of a hip fracture, the extent to which a return to pre-depression functionality is effective, has not yet been understood. It has been reported in studies of depression in the rehabilitation period that the risk of falling causes problems in independent walking and there is an increased tendency to infections.^{1,10,11}

The aim of this study was to examine the effects of depression on functional healing and a return to previous daily activities in elderly patients with a hip fracture.

2. Material methods

2.1. Study setting and sample

The study initially comprised 128 patients aged 65 years and above who were operated on in the Orthopaedics and Traumatology Clinic for a unilateral hip fracture as a result of a fall and had a partial endoprosthesis applied between 2009 and 2012. A total of 24 patients were excluded from the study for reasons of pathological fracture, multi-trauma, not of a sufficiently appropriate cognitive level or non-attendance at the 6-month follow-up examination. The remaining 104 cases were included in the prospective, comparative study for evaluation of daily living activities and functional improvements. The evaluations were conducted by face-to-face interviews with the patients by the same orthopaedist and psychiatrist at 6 weeks and 6 months.

With a sociodemographic form related to the socio-demographic and some clinical data of all the patients in the study, the Geriatric Depression Scale (GDS) was applied at 6 weeks and the Physical Self-Maintenance Scale – Activities of Daily Living (ADL) was applied at 6 weeks and 6 months to evaluate daily living activities and functional improvements.

Approval for the study was granted by the Local Ethics Committee and informed consent was obtained from all the participants.

2.2. Measurements

2.2.1. Geriatric Depression Scale (GDS)

This scale was especially developed to evaluate depression in the elderly population.¹² In the short version consisting of 15 items, various dimensions are examined related to mood such as self-esteem, stressful thoughts, positive attitudes to life and judgments. All questions are answered by yes or no and total scoring varies from 0 to 15. Patients with a score of 6 or above are categorized as depressed.

2.2.2. Physical Self-Maintenance Scale (ADL)

This scale evaluates performance related to physical activities in 6 items of toilet, self-feeding, self-dressing, self-grooming, self-ambulating and self bathing. A low total score indicates a high level of impairment of daily living activities. Total scoring varies from 0 to 6.¹³

2.3. Statistical analysis

The results were analysed using SPSS 15.0 (SPSS Inc., Chicago, IL, USA) software program. Descriptive statistics were stated as mean \pm standard deviation (SD) for continuous variables and as number of cases (n) and percentage (%) for categorical variables. Normal distribution of data was examined with the Kolmogorov–Smirnov test. In the comparison of depression points between groups not showing normal distribution, the Mann–Whitney U-test was applied and in the analysis of groups showing normal distribution the Independent t-test was applied. ANOVA and ANCOVA models were applied in the analysis of the effect of depression on the changes in the score of the repeated daily living activity scale. In all analyses, a value of $p < 0.05$ was accepted as statistically significant.

3. Results

In the current study, the patients were separated into 2 groups of depressed and non-depressed according to the GDS applied in the 6th week. Sociodemographic characteristics of the patients, including age, gender, marital status, level of education and place of residence are shown in Table 1. It was determined that 76.9% of the patients were female, 63.5% were married, 73.1% had a primary school level of education and 62.5% lived together with a spouse or children.

Of the total cases, 46.2% were evaluated as depressed and of those, 72.9% were female. The depression points of the GDS were determined as 4.71 ± 2.79 for females and 3.33 ± 3.30 for

Table 1 – Descriptive and clinical characteristics of depressed and non-depressed groups.

	Cases (n = 104)	Depressed (n = 48)	Non-depressed (n = 56)
Age, mean(SD), years	78.79 (7.33)	76.48 (7.24)	81.1 (7.42)
Gender, n(%)			
Male	24 (23.1)	13 (27.1)	11 (19.6)
Female	80 (76.9)	35 (72.9)	45 (80.4)
Marital status, n(%)			
Married	66 (63.5)	25 (52.1)	41 (73.2)
Widowed	38 (36.5)	23 (47.9)	15 (26.8)
Education, n(%)			
Illiterate	7 (6.7)	5 (10.4)	2 (3.6)
Primary school	76 (73.1)	30 (62.5)	46 (82.1)
High school	13 (12.5)	8 (16.7)	5 (8.9)
University	8 (7.7)	5 (10.4)	3 (5.4)
Place of residence, n(%)			
Home alone	39 (37.5)	20 (41.7)	19 (33.9)
Home with others	65 (62.5)	28 (58.3)	37 (66.1)

males and the difference between the genders in respect of the depression scores was found to be statistically significant ($p = 0.045$). In respect of marital status evaluation, while 37.9% of married cases were depressed, this rate was 60.5% for widowed individuals. The mean GDS for married cases was 3.51 ± 2.76 , and 5.92 ± 2.74 for those who were widowed and this difference was statistically significant ($p = 0.000$).

No statistically significant relationship was determined between education level and depression in cases of hip fracture ($p = 0.229$). Depression was determined in 51.3% of those who lived alone and in 43.0% of those who lived with a spouse and/or children. The mean GDS was 4.07 ± 2.89 for those living with others and 4.92 ± 3.08 for those living alone. The difference was not statistically significant ($p = 0.162$).

In the evaluation according to the ADL, the mean scores of those with and without depression at 6 weeks were 3.27 ± 0.89 and 4.88 ± 0.81 respectively. In the evaluation made at 6 months, the mean ADL scores were determined as 3.54 ± 1.03 for those with depression and 5.10 ± 0.82 for those without depression. The analysis results revealed that the change in the mean ADL scores was related to depression at a statistically significant level ($p = 0.000$). In addition, a negative correlation was determined between the GDS score and ADL at both 6 weeks and 6 months ($r: -0.561, p = 0.000$; $r: -0.617, p = 0.000$).

4. Discussion

In parallel with an increasing elderly population, the rates of hip fractures are also increasing. The most significant problem seen in the elderly following hip fracture treatment is the rehabilitation process. The main aim of treatment is to reach a level of activity after surgery and rehabilitation which is close to that person's previous level. Results can be affected by personal differences of age, co-morbidities, physical and psychological differences.¹⁴

In this study, the functional results of patients aged 65 years and above who were treated with a hip prosthesis following a hip fracture, were compared by separating them into two groups of depressed and non-depressed. In previous studies the prevalence of depression in the elderly following a hip fracture has been reported as varying between 9% and 47%.¹⁵⁻¹⁶ In the current study, according to the GDS applied at the 6-week postoperative follow-up examination to 104 patients, depression was determined in 46.2%. This result conforms with rates in literature and as a value close to the upper limit shows depression in nearly one in two patients. In studies in the general population, the most important predictive factors of depression in the elderly have been defined as female gender, having another disease, low social support and being divorced, separated or widowed.¹⁷ Similarly, according to the findings of the current study, when the relationship of sociodemographic factors with depression was examined, depression was more often seen in females and widows. Therefore, it should be noted that there is a need for greater care in terms of depression in hip fracture cases particularly in this group of elderly individuals.

The ADL scores of the depressed patients were determined as lower than those of the non-depressed patients at both

postoperative 6 weeks and at the end of the rehabilitation process at 6 months. A relationship was also determined between the presence of depression and a worse level of daily living activity. It has been reported that complaints of depression affect self-care ability and an increase in self-care ability indirectly decreases complaints of depression.¹⁸

In a study by Bostrom et al of 392 cases in the general elderly population, it was emphasized that there was an independent relationship of low functional capacity with depression symptoms in the elderly.¹⁹ In the elderly who cannot walk well for daily living activities, social isolation often occurs and social isolation is in itself a risk factor for depression.¹⁷ Therefore, there can be said to be a vicious circle of low ADL as both a result of depression and that it can increase depression complaints caused by feelings of insufficient daily activity.

In a long-term study by Fredman et al, functional healing was evaluated after 2 years in elderly cases with hip fractures and depression was reported to have affected healing.²⁰ The current study results also demonstrated a negative effect of depression on daily living activities at the end of a 6-month period. Active participation of the patient in the rehabilitation process has a positive effect on healing. However, the presence of depression will disrupt this process because of reluctance, negative cognition and symptoms similar to psychomotor retardation. On the other hand, the findings of recent studies that depression extended the healing process by impairing the immune system and increased the predisposition to infections have been supported with both biological and clinical research.¹

In the current study, depression in elderly cases of hip fracture was found to have negatively affected daily living activity. Depression was determined to be observed more often in females and those who had lost their spouse. In addition, as together with an increase in the severity of depression the daily living activity level is reduced, the importance of treatment for depression is greater. In conclusion, the findings of this study showed a need for treatment of hip fractures not to be limited to only surgery and subsequent physical rehabilitation, but that psychiatric and social support must also be provided.

Conflicts of interest

All authors have none to declare.

REFERENCES

1. Phillips AC, Upton J, Duggal NA, Carroll D, Lord JM. Depression following hip fracture is associated with increased physical frailty in older adults: the role of the cortisol: dehydroepiandrosterone. *BMC Geriatr.* 2013;13:60.
2. Young Y, Xiong K, Pruzek RM. Longitudinal functional recovery after postacute rehabilitation in older hip fracture patients: the role of cognitive impairment and implications for long-term care. *J Am Med Dir Assoc.* 2011;12:431-438.
3. Bottle A, Aylin P. Mortality associated with delay in operation after hip fracture: observational study. *Br Med J.* 2006;332:947-951.

4. Paksima N, Koval KJ, Aharanoff G, et al. Predictors of mortality after hip fracture: a 10-year prospective study. *Bull NYU Hosp Jt Dis.* 2008;66:111-117.
5. Orosz GM, Magaziner J, Hannan , et al. Association of timing of surgery for hip fracture and patient outcomes. *J Am Med Assoc.* 2004;291:1738-1743.
6. Benetos IS, Babis GC, Zoubos AB, et al. Factors affecting the risk of hip fractures. *Injury.* 2007;38:735-744.
7. Healee DJ, McCallin A, Jones M. Older adult's recovery from hip fracture: a literature review. *Int J Orthop Trauma Nurs.* 2011;5:18-28.
8. Jacobson N, Greenley D. What is recovery? A conceptual model and explication. *Psychiatr Serv.* 2001;52:482-485.
9. Nightingale S, Holmes J, Mason J, House A. Psychiatric illness and mortality after hip fracture. *Lancet.* 2001;357:1264-1265.
10. Lenze EJ, Munin MC, Dew MA, et al. Adverse effects of depression and cognitive impairment on rehabilitation participation and recovery from hip fracture. *Int J Geriatr Psychiatry.* 2004;19:472-478.
11. Morghen S, Bellini G, Manuele S, Guerini F, Frisoni G, Trabucchi M. Moderate to severe depressive symptoms and rehabilitation outcome in older adults with hip fracture. *Int J Geriatr Psychiatry.* 2011;26:1136-1143.
12. Yesavage JA, Brink TL, Rose TL, et al. Development and validation of a geriatric depression screening scale: a preliminary report. *J Psychiatr Res.* 1983;17:37-49.
13. Lawton MP, Brody EM. Assessment of older people: self-maintaining and instrumental activities of daily living. *Gerontologist.* 1969;9:179-186.
14. Beloosesky Y, Grinblat J, Epelboym B, Hendel D. Dementia does not significantly affect complications and functional gain in elderly patients operated on for intracapsular hip fracture. *Arch Orthop Trauma Surg.* 2001;121:257-260.
15. Holmes JD, House AO. Psychiatric illness in hip fracture. *Age Ageing.* 2000;29:537-546.
16. Shin DS. BMI, depression and fluid deficit in hospitalized elders. *J Korean Acad Fundam Nurs.* 2007;14:83-91.
17. Djernes JK. Prevalence and predictors of depression in populations of elderly: a review. *Acta Psychiatr Scand.* 2006;113:372-387.
18. Lieberman D, Galinski D, Fried V, et al. Geriatric depression screening scale (GDS) in patients hospitalized for physical rehabilitation. *Int J Geriatr Psychiatry.* 1999;14:549-555.
19. Bostrom G, Condradsson M, Rosendahl E, Nordstrom P, Gustafson Y, Littbrand H. Functional capacity and dependency in transfer and dressing are associated with depressive symptoms in older people. *Clin Interv Aging.* 2014;9:249-257.
20. Fredman L, Hawkes WG, Black S, et al. Elderly patients with hip fracture with positive affect have better functional recovery over 2 years. *J Am Geriatr Soc.* 2006;54:1074-1081.