

Depression and Poor Functional Results in Elder Patients with Hip Fracture

Razvan Cosmin Tudor

County Emergency Hospital
Str. Ștefan cel Mare, Nr.233, Vaslui, 730006, Romania
Phone: 0235312120

Nicola Vendemmia

Médipôle Saint-Roch - Groupe Elsan
2 Rue Madeleine Brès, 66330 Cabestany, France

Mihaela Pertea

Grigore T. Popa University of Medicine and Pharmacy
Strada Universității 16, Iași 700115
Phone: 0232 301 600

Viola Badulescu

Grigore T. Popa University of Medicine and Pharmacy
Strada Universității 16, Iași 700115
Phone: 0232 301 600

Aurel Nechita

Dunărea de Jos University of Galați
Strada Domnească 47, Galați, Romania
Phone: 0336 130 108
nechitaurel@yahoo.com

Anamaria Ciubara

Dunărea de Jos University of Galați
Strada Domnească 47, Galați, Romania
Phone: 0336 130 108
anamburlea@yahoo.com

Abstract

Depression is the most common psychiatric disorder in the elderly, as well as one of the most common comorbidities in patients with hip fracture. Although many authors have confirmed that clinically recognized depressive symptomatology after hip fracture has a negative impact on functional outcomes and mortality, the role of depressive symptomatology evaluated at the time of admission remains insufficiently investigated. Depression can be assessed using the Geriatric Depression Scale. Predictor measurements of rehabilitation results that can interact with depression can be obtained. Linear multiple regression modeling can be used to evaluate the relationship between depression and functional outcome. The identified factors associated with the postoperative 1 and 2 year follow-up of a hip fracture should be incorporated into clinical strategies and postoperative nursing to provide muscle rehabilitation and good functional outcomes. In addition, the health care plan must ensure, before discharge, that the community in which older adults live provides nutritional education, cognitive screening and psychological support. Depression is a common disorder among orthopedic patients. A previous psychiatric diagnosis predisposes patients to depression following a trauma. The socio-economic status is also a predictive factor for increasing depression scores at 9 months after discharge. Patients with a greater sense of support from friends and family have an inverse correlation with depression. Reestablishing the quality of life the patient had before the fracture also seems to have a protective effect against depression. The severity of the trauma does not seem to affect the scores for the evaluation of depression. Psychiatric counseling can avoid associated psychiatric comorbidities in trauma patients. High

levels of depressive symptomatology in elderly patients with hip fracture influence functional outcomes both in the short and the long term. We firmly support the introduction of the routine evaluation of this comorbidity. Failure to identify this associated pathology in patients with hip fracture represents a missed opportunity for eventual improvement in both early and late functional outcomes.

1. Background

As a result of medical progress, there is a growing life expectancy in general population, which means that the increase number of hip fractures is inevitable (Atay et. al., 2016). Hip fractures in people over the age of 65 raise major problems of morbidity, functional disability and even mortality (Phillips et. al., 2013; Young, Xiong, & Pruzek, 2011; Bottle & Aylin, 2006). Despite all the developments in current surgical interventions, anesthesia techniques, postoperative care and rehabilitation techniques, the mortality rate in the first year after the fracture was reported as 14% -36% (Phillips et. al., 2013; Young, Xiong, & Pruzek, 2011; Bottle & Aylin, 2006; Paksima et. al., 2008).

Depression is the most common psychiatric disorder in the elderly, as well as one of the most common comorbidities in patients with hip fracture. Although many authors have confirmed that clinically recognized depressive symptomatology after hip fracture has a negative impact on functional outcomes and mortality, the role of depressive symptomatology evaluated at the time of admission remains insufficiently investigated (Dubljanin Raspopović et. al., 2014; Yeh et. al., 2017; Ciubară et. al., 2018).

Hip fracture is an important and debilitating condition in older people, especially women. Epidemiological data vary from country to country, but it is estimated that hip fractures affect about 18% of women and 6% of men. Although standardized age-related incidence gradually decreases in many countries, it is much higher than the aging population. Thus, it is estimated that the overall number of hip fractures will increase from 1.26 million in 1990 to 4.5 million by 2050. The direct costs associated with this condition are enormous as it requires a long period of further hospitalization and rehabilitation. In addition, hip fracture is associated with the development of other conditions, such as disability, depression and cardiovascular disease, alcohol withdrawal (Ciubară et. al., 2015; Ciubară et. al., 2018), with additional costs for society. In this review, we present the latest epidemiological data on hip fracture, indicating the known risk factors and conditions that seem relevant to determining this condition. A specific part is devoted to social costs caused by hip fracture. Although hip fracture costs are likely to be comparable to other common diseases with increased hospitalization rates (eg cardiovascular disease), other social costs (due to the onset of new comorbidities, sarcopenia, low quality of life, disability and mortality) are greater (Veronese & Maggi, 2018).

The main purpose in the treatment of hip fractures in elderly patients is immediate mobilization and regaining the functionality of the pre-fracture period, implicitly restoring the quality of life. However, compared to the pre-fracture period, 55% -75% of cases experience a loss of activities in their daily lives (Phillips et. al., 2013; Young et. al., 2011; Bottle & Aylin, 2006; Paksima et. al., 2008; Orosz et. al., 2004). In studies on risk factors related to the physical comorbidity of most patients with hip fracture, such as diabetes mellitus, hypertension and chronic obstructive pulmonary disease, there has been little evidence of morbidity and mortality rates in the life of practitioners. As a consequence, recent studies have identified the need to include psychological health and social factors in addition to ensuring physical integrity in treatment (Benetos et. al., 2007; Dubljanin Raspopović et. al., 2014).

Although it is ignored in most elderly patients, depression is the most common psychological disorder a true co-morbidity of patients with hip fracture (Yeh et. al., 2017). However, in the treatment of a hip fracture, the extent to which the return to pre- depression is effective, has not yet fully understood. In recent depression studies, it was reported that the risk of

falling causes independent walking problems and there is an increased tendency to infection (Altay et. al., 2016; Ciubara et. al., 2018; Ciubara et. al., 2015).

2. Method

In parallel with a growing population, hip fracture rates are also rising. The most important problem seen in the elderly after the treatment of hip fracture is the rehabilitation process. The primary goal of treatment is to achieve a level of activity after surgery and rehabilitation, which is close to the previous level of that person. The results may be affected by personal differences of age, co-morbidity, physical and psychological differences (Rathbun et. al., 2018).

Depression after hip fracture in older adults is associated with worse physical performance; however, depressive symptoms are dynamic, fluctuating during the recovery period.

Depression can be assessed using the Geriatric Depression Scale. Predictor measurements of rehabilitation results that can interact with depression can be obtained. Linear multiple regression modeling can be used to evaluate the relationship between depression and functional outcome (Becher et. al., 2014; Bhandari et. al., 2008). The identified factors associated with the postoperative 1 and 2-year follow-up of a hip fracture should be incorporated into clinical strategies and postoperative nursing to provide muscle rehabilitation and good functional outcomes. In addition, as part of the health care plan before hospital discharge, it must ensure that the community in which older adults live provides nutritional education, cognitive screening and psychological support (Anakwe et. al., 2011; Engel, 1977). Positive and negative affect were assessed over time in a sample of older adults recruited after surgery for hip fracture and a comparison sample of older adults without hip fracture. For most of the individuals with a hip fracture, positive affect tended to increase over time whereas negative affect tended to decrease, suggesting that most people had at least some recovery of affect. In addition, individuals who showed a slower decrease in negative affect had higher levels of depression 1 year later, and individuals who showed a sharper increase in positive affect had superior physical function 1 year later (Langer et. al., 2015).

3. Results and Discussion

Depression is a common disorder among orthopedic patients. A previous psychiatric diagnosis predisposes patients to depression following a trauma. Socio-economic status is also a predictive factor for increasing depression scores at 9 months. Patients with a greater sense of support from friends and family have an inverse correlation for depression (Fortin et. al., 1999; van den Akker-Scheek et. al., 2007; O'Toole et. al., 2008). Reestablishing the quality of life that the patient had before the fracture also seems to have a protective effect against depression. The severity of the trauma does not seem to affect the scores for the evaluation of depression. Psychiatric counseling can avoid associated psychiatric comorbidities in trauma patients (Sirbu et. al., 2017). The correlation between single neuropsychiatric symptoms and functional outcome in hip fracture patients is little investigated in the literature, and it is not yet established which neuropsychiatric symptoms are the most important determinants of functional outcome. Among the neuropsychiatric symptoms, irritability and agitation are the most important. They are associated to poor functional outcome and are the only determinants of motor-FIM outcome measures. Relationships between specific neuropsychiatric symptoms and functional outcome have not been clearly described in hip fracture patients. Irritability and agitation have been shown to have the strongest relationship with poor functional outcomes. Appropriate identification, assessment and treatment of neuropsychiatric symptoms may be useful to physicians for the management of hip fracture patients (Gialanella et. al., 2014). Disturbances in cognition and rehabilitation participation are common and are associated with poorer rehabilitation outcome. Behaviors reflective of depression and anxiety are relatively uncommon and not associated with rehabilitation outcome. Rehabilitation staff frequently detect and document disturbances in cognition and participation that are associated with poorer rehabilitation outcome. It is recommended that staff observations be routinely added to mental health evaluations. Additionally, routine mental health screening and

required staff documentation of behaviors would improve the case detection rate (Dorra et. al., 2002; Condratovici et. al., 2018).

In a study by Bostrom et. al. (2014), 392 cases in the elderly general population, it was emphasized that there is an independent relationship with low functional capacity with symptoms of depression in the elderly (Langer et. al., 2015). If the elderly who cannot go well for day- isolation often occurs and social isolation is in itself a risk factor for depression. It can therefore be said that it is a vicious circle of low ADL both as a result of depression and that it can increase the depression caused by the feelings of a insufficient daily activities.

In a long-term study by Fredman et. al. (2006), functional healing was evaluated after 2 years in age-related cases with hip fractures and depression was affected by healing (Fortin et. al., 1999). The results of the current study also demonstrated an effect negative impact of depression on daily activities at the end of a 6-month period. The active participation of the patient in the rehabilitation process has a positive effect on healing. However, the presence of depression will interrupt this process due to reticence, negative knowledge, and symptoms similar to psychomotor retardation. On the other hand, the findings of recent studies on the fact that depression has expanded the healing process by affecting the immune system and increased susceptibility to infections have been supported by both clinical and biological research.

Patients with symptoms of depression were less able to engage in activities of daily living than non-depressed patients and took significantly longer to complete a walking speed test at follow-up. They also scored significantly worse on the Berg balance scale, used to measure balance in older people with impairment, at week six compared to non-depressed patients, and they spent a significantly longer in hospital and/or rehabilitation centers.

4. Conclusions

High levels of depressive symptomatology in elderly patients with hip fracture influence functional outcomes both in the short and the long term. We firmly support the introduction of the routine evaluation of this comorbidity. Failure to identify this associated pathology in patients with hip fracture represents a missed opportunity for eventual improvement in both early and late functional outcomes.

References

- Anakwe, R., Jenkins, P., & Moran, M. (2011). Predicting Dissatisfaction After Total Hip Arthroplasty: A Study of 850 Patients. *The Journal Of Arthroplasty*, 26(2), 209-213. doi: 10.1016/j.arth.2010.03.013.
- Atay, İ., Aslan, A., Burç, H., Demirci, D. and Atay, T. (2016). Is depression associated with functional recovery after hip fracture in the elderly?. *Journal of Orthopaedics*, 13(2), pp.115-118.
- Becher, S., Smith, M., & Ziran, B. (2014). Orthopaedic Trauma Patients and Depression. *Journal Of Orthopaedic Trauma*, 28(10), e242-e246. doi: 10.1097/bot.000000000000128.
- Bhandari, Mohit & Busse, Jason & Hanson, Beate & Leece, Pamela & Ayeni, Olufemi & H Schemitsch, Emil. (2008). Psychological distress and quality of life after orthopedic trauma: An observational study. *Canadian journal of surgery. Journal canadien de chirurgie*. 51. 15-22.
- Bostrom G., Condradsson M., Rosendahl E., Nordstrom P., Gustafson Y., & Littbrand H. (2014). Functional capacity and dependency in transfer and dressing are associated with depressive symptoms in older people. *Clin. Interv. Aging*. 9. 249–257.
- Bottle, A. and Aylin, P. (2006). Mortality associated with delay in operation after hip fracture: observational study. *BMJ*, 332(7547), pp.947-951.
- Ciubară, A., Burlea, Ș., Săcuiu, I., Radu, D., Untu, I., & Chiriță, R. (2015). Alcohol Addiction – A Psychosocial Perspective. *Procedia - Social And Behavioral Sciences*, 187, 536-540. doi: 10.1016/j.sbspro.2015.03.100.

- Ciubară, A.B. & Tudor, R.C. & Nechita, L & Ovidiu, Tita & Ciubara, A & Turliuc, S & Raftu, G. (2018). The composition of bioactive compounds in wine and their possible influence on osteoporosis and on bone consolidation. *Revista de Chimie*. 69. 1247-1253.
- Ciubara, A.B., Nechita, A., Tudor, R.C., Matei, M., Tutunaru, D., Sirbu, P.D. (2018). Social and Medical Ethics: Implications for Romanian Protocols Regarding the Therapy of Alcohol Withdrawal Syndrome in Trauma Patients. *Revista de Cercetare si Interventie Sociala*, 60, 174-179.
- Condratovici, C. P., Ilie, M., Mihai, M., Condratovici, A. P., Chihai, J., Baciuc, G. (2018). Anxiety associated with visit to the dentist. *Romanian Journal of Oral Rehabilitation*. 10(2), 86-90.
- Dorra, H., Lenze, E., Kim, Y., Mulsant, B., Munin, M., Dew, M., & Reynolds, C. (2002). Clinically Relevant Behaviors in Elderly Hip Fracture Inpatients. *The International Journal Of Psychiatry In Medicine*, 32(3), 249-259. doi: 10.2190/6rek-nyyd-maxf-td34.
- Dubljanin Raspopović, E., Marić, N., Nedeljković, U., Ilić, N., Tomanović Vujadinović, S., & Bumbaširević, M. (2014). Do depressive symptoms on hospital admission impact early functional outcome in elderly patients with hip fracture?. *Psychogeriatrics*, 14(2), 118-123. doi: 10.1111/psyg.12049.
- Engel, G. (1977). The need for a new medical model: a challenge for biomedicine. *Science*, 196(4286), 129-136. doi: 10.1126/science.847460
- Fortin, P., Clarke, A., Joseph, L., Liang, M., Tanzer, M., & Ferland, D. et. al. (1999). Outcomes of total hip and knee replacement: Preoperative functional status predicts outcomes at six months after surgery. *Arthritis & Rheumatism*, 42(8), 1722-1728. doi: 10.1002/1529-0131(199908)42:8<1722::aid-anr22>3.0.co;2-r
- Fredman, L., Hawkes, W. G., & Black, S. (2006). Elderly patients with hip fracture with positive affect have better functional recovery over 2 years. *J Am Geriatr Soc*. 54. 1074-1081.
- Gialanella, B., Ferlucci, C., Monguzzi, V., & Prometti, P. (2014). Determinants of functional outcome in hip fracture patients: the role of specific neuropsychiatric symptoms. *Disability And Rehabilitation*, 37(6), 517-522. doi: 10.3109/09638288.2014.932446.
- Langer, J., Weisman, J., Rodebaugh, T., Binder, E., & Lenze, E. (2015). Short-term affective recovery from hip fracture prospectively predicts depression and physical functioning. *Health Psychology*, 34(1), 30-39. doi: 10.1037/hea0000111.
- O'Toole, R., Castillo, R., Pollak, A., MacKenzie, E., & Bosse, M. (2008). Determinants of Patient Satisfaction After Severe Lower-Extremity Injuries. *The Journal Of Bone & Joint Surgery*, 90(6), 1206-1211. doi: 10.2106/jbjs.g.00492.
- Paksima, Nader & J Koval, Kenneth & Aharanoff, Gina & Walsh, Michael & Kubiak, Erik & D Zuckerman, Joseph & Egol, Kenneth. (2008). Predictors of mortality after hip fracture: A 10-year prospective study. *Bulletin of the NYU hospital for joint diseases*. 66. 111-7.
- Phillips, A., Upton, J., Duggal, N., Carroll, D. and Lord, J. (2013). Depression following hip fracture is associated with increased physical frailty in older adults: the role of the cortisol: dehydroepiandrosterone sulphate ratio. *BMC Geriatrics*, 13(1).
- Rathbun, A., Shardell, M., Stuart, E., Gruber-Baldini, A., Orwig, D., & Ostir, G. et. al. (2018). Persistence of depressive symptoms and gait speed recovery in older adults after hip fracture. *International Journal Of Geriatric Psychiatry*, 33(7), 875-882. doi: 10.1002/gps.4864.
- Sirbu, P.D., Tudor, R.J., Berea, G., Scripcaru, A., Ciubara, B., & Bădulescu, O.V. (2017). Bipolar Polyethylene Radial Head Arthroplasty in Posttraumatic Unstable Elbows Prosthetic design and clinical results.
- van den Akker-Scheek, I., Stevens, M., Groothoff, J., Bulstra, S., & Zijlstra, W. (2007). Preoperative or postoperative self-efficacy: Which is a better predictor of outcome after total hip or knee arthroplasty?. *Patient Education and Counseling*, 66(1), 92-99. doi: 10.1016/j.pec.2006.10.012.

- Veronese, N., & Maggi, S. (2018). Epidemiology and social costs of hip fracture. *Injury*, 49(8), 1458-1460. doi: 10.1016/j.injury.2018.04.015.
- Yeh, H., Shao, J., Li, C., Wu, C., & Shyu, Y. (2017). Predictors of postoperative falls in the first and second postoperative years among older hip fracture patients. *Journal Of Clinical Nursing*, 26(21-22), 3710-3723. doi: 10.1111/jocn.13743.
- Young, Y., Xiong, K. and Pruzek, R. (2011). Longitudinal Functional Recovery After Postacute Rehabilitation in Older Hip Fracture Patients: The Role of Cognitive Impairment and Implications for Long-Term Care. *Journal of the American Medical Directors Association*, 12(6), pp.431-438.