

ORIGINAL ARTICLE

Frequency of Re-Fracture in Osteoporotic Patients

ASAD HANIF¹, ASIF ALI SHAIKH², MUHAMMAD RAFIQUE JAKHRANI³, RASHEED AHMED BHATTI⁴, FAHAD NOOR MEMON⁵, WALIULLAH QURESHI⁶

¹Consultant Orthopedic Surgeon Saifee Hospital Karachi

²Assistant Professor, CMC SMBBMU Larkana

³Specialist Orthopedic Surgeon Sindh Govt Services Hospital Karachi

⁴Sr Registrar Bilawal Medical College Jamshoro

⁵Consultant Orthopedic Surgeon DUHS Karachi

⁶PG Trainee DUHS Karachi

Corresponding author: Asif Ali Shaikh, Email: drasifalishaikh@yahoo.com, Cell: 03337801866

ABSTRACT

Aim: To determine the frequency of re-fracture in osteoporotic patients presenting @ SMBBMU Larkana

Subject and Methods: This is Descriptive Cross-sectional study, accompanied at Department of Orthopedics, SMBBMU and Civil hospital Karachi, for period of 6 months from 19-07-2018 to 19-01-2019. Total of 130 osteoporotic patients with previous fracture were included in this study. Brief histories for the duration of present complain and history of previous fracture was taken. Presence of pain, tenderness and mobility at the site of trauma was noted. X rays Antero-posterior/Lateral of the effected site was done and presence of fracture with break in the continuity of the bone was considered as re-fracture. Data was collected on structured proforma.

Results: A total of 130 osteoporotic patients with previous fracture were selected in our study. The average age of the patients was 58.77±4.27 years. Average duration of presenting complains and previous fractures were 3.93 ± 0.87 days and 7.11±1.23 months. There were 1:1 male to female ratio. Out of 130 patients, 68.46% were type II diabetic, 83.85% were hypertension.

Frequency of re-fracture in osteoporotic patients was observed in 8.46% (11/130)

Conclusion: Fracture is common presentation in osteoporotic bones. Our study showed that rates of re-fracture range up to 8.46% in patients with an initial osteoporotic fracture, depending on the type of initial fracture.

Keywords: Osteoporosis, Osteoporotic fractures, fracture and Re-fracture.

INTRODUCTION

Nowadays due to active life style aging population is increasing day by day especially in developed countries. [1] With advanced age incidence of osteoporosis increases proportionally worldwide [2] Trauma is leading cause of fracture but in older age population osteoporosis also main important factor of not only primary but also recurrent fracture [3] It is noted in literature that fracture location has osteoporotic fractures has significant impact on location of fracture with age. [4] It is noted that osteoporotic fractures are increasing day by day in our population. [5] It is further evaluated that those patients who have osteoporosis along with fracture have increased risk of re fracture, leading to increased level of morbidity and mortality. [6] Osteoporotic fracture with advanced age in the region of hip and vertebral bodies leads to permanent disability leading to increased hospital stay and cost of treatment. [7] Due to which it will increase not only financial load on family but more care and time required by aging people, as it is long lasting process. [8] Majority of aging persons do not know about their osteoporosis level until they present with fracture. So much care should be given to elderly population to prevent repetition of fracture.

In a study the location of osteoporotic fracture at baseline were trunk 12.7%, hip 15.5%, vertebra 29.1%, upper limb 25.1% and lower limb 17.5%. Location of osteoporotic re-fractures were trunk 10.7%, hip 17.1%, vertebral 34.2%, upper limb 21.7% and lower limb 16.4%. At regular follow up on around 5 years around 15% patients presented with re-fracture of hip. After 1st fracture second fracture was seen around 3% patients at five years and 10% at 5 years subsequently. [9]

The rationale of the study is that the data on this topic is available internationally but there is dearth of data locally. Therefore this study is designed to generate local data thereby strategies could be developed to take prophylactic measures to reduce the incident of fractures and re-fractures among osteoporotic elderly individuals.

SUBJECT AND METHODS

This is Descriptive Cross-sectional study, carried out at Department of Orthopedics, Civil hospital Karachi, for period of 6 months from 19-07-2018 to 19-01-2019. Total of 130 osteoporotic patients with previous fracture with in last 02 years and presenting with history of fall within a week were selected in this study. Brief

histories for the duration of present complain and history of previous fracture was taken. Presence of pain, tenderness and mobility at the site of trauma was noted. X rays Antero-posterior/Lateral of the effected site was done and presence of fracture with break in the continuity of the bone was considered as re-fracture. All the patients with fracture due pathological fracture, road traffic accidents, fall from height or assaults were excluded from our study. Informed consent was taken from the patients or care givers for induction in the study, Data was collected on structured proforma.

Before conducting study, approval from the research department Institutional review board was obtained. Patients presenting to the outpatients or emergency department meeting the inclusion criteria was registered in the study post informed consent. Informed consent was taken from the patients or care givers for induction in the study. Brief history for the duration of present complain and previous fracture, comorbid conditions like T2DM (documented history and on treatment), hypertension (documented history and on treatment), chronic kidney disease (documented history and on treatment) and demographics like age, residential status (Rural, urban) family monthly income and educational level. Presence of pain, tenderness (on examination) and mobility (on examination) at the site of trauma was noted. X rays AP/Lat of the effected site was done and presence of fracture with break in the continuity of the bone was considered as re-fracture. Data was collected on structured proforma for all the variables stated above and presence of re-fracture was documented on the structured proforma attached as annexure.

Data was entered and analyzed in the SPSS version 21 and mean with standard deviation was computed for numeric variables like age, duration of complain, duration of previous fracture and family monthly income. Frequency and percentage was computed for gender, comorbid conditions like type II diabetes mellitus and hypertension.

Stratification with respect to age, gender, duration of complain, duration of previous fracture, comorbid conditions like T2DM, hypertension was performed to see the effect of these on re-fracture. Post-stratification chi square test was applied and p value less than 0.05 considered significant.

RESULTS

A total of 130 osteoporotic patients with previous fracture were selected in this study. Age distribution of the patients is shown in figure 1, which suggest most of patients around 49.23% with the range of 56 to 60 years, 31.54% and 19.23 above the 60 and below the age of 55 years respectively as shown in Figure . The average age of the patients was 58.77±4.27 years.

Average duration of presenting complains and previous fractures were 3.93 ± 0.87 days and 7.11±1.23 months as presented in Table No 01.

Out of 130 patients, 68.46% were type II diabetic, 83.85% were hypertension and 15.38% had chronic kidney diseases respectively.

Frequency of re-fracture in osteoporotic patients was observed in 8.46% (11/130) as presented in Figure NO: 02. Rate of re-fracture was not statistically significant among age groups (p=0.263. Rate of re-fracture was not statistically significant with gender, resident, family income, duration of presenting complain, duration of previous fracture, diabetic and hypertensive status respectively while rate of re-fracture was significantly high in CKD and Illiterate cases respectively.

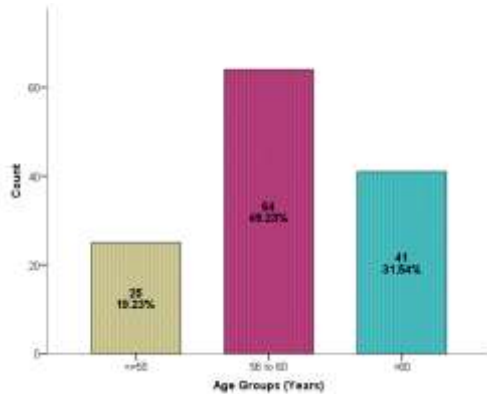


Figure 1: Age Distribution of the Patients n=130

Table 1: Descriptive Statistics of Characteristics of Patients

Variables	Mean	Std. Deviation	95% Confidence Interval for Mean	
			Lower Bound	Upper Bound
Age (Years)	58.77	4.27	58.03	59.51
Duration of presenting complain (days)	3.93	0.87	3.78	4.08
Duration of previous fracture (Months)	7.11	1.23	6.89	7.32
Family Income (Rs.)	32128.15	12472.24	29963.87	34292.44

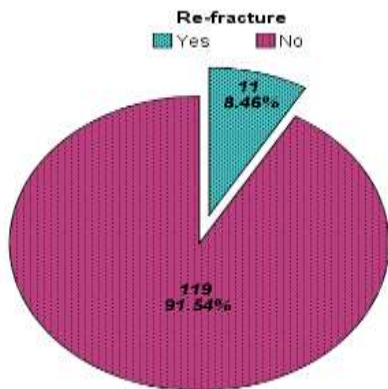


Figure 2: Frequency of Re-Fracture in Osteoporotic n=130

DISCUSSION

Osteoporosis is aging phenomenon characterized by loss of bone mineral density leading to weakness and possibility of early fracture. In comparison to routine, osteoporotic bone fractures occurs even after minor degree of trauma like ground level fall in older patients. It is said that osteoporotic bones are weak leading to increased risk of fracture that will increase financial burden on family and country.^[10,11,12] Due to advance in care, aging population is on rise leading to increased risk of osteoporosis and increased of fracture in osteoporotic bones. According to clinical experience of orthopedic surgeons, not only fracture in common in osteoporotic bones but there is increased risk of re-fracture. To determine the frequency of re-fracture in osteoporotic patients, a total of 130 osteoporotic patients of either gender, aged above 50 years, with previous fracture were selected in this study. Most of the patients are from 56-60 years of age and the average age of the patients was 58.77±4.27 years. It is reported that approximately 50% of women and 22% of men having age more than 50 years will present once in their life for fracture due to osteoporosis.^[13,14] But in our study 49.2% were males and 50.7% were females making male to female ratio 1:1.

A history of osteoporotic fracture confers a heightened risk of experiencing a subsequent fracture beyond that conferred by low bone mineral density (BMD). A 2004 meta-analysis reported that patients with a previous fracture had an 86% greater risk of experiencing a subsequent fracture than patients who had not experienced an incident fracture; the risk was 77% greater.^[15] In the ongoing Dubbo Osteoporosis Epidemiology Study, the relative risk of subsequent fracture in Australian men and women with an incident low-trauma fracture was > 2.0.^[16] In the Tromso Study in Norway, the age-adjusted relative risk of subsequent fracture was 1.3 in women and 2.0 in men.^[17] In U.S. studies of subsequent fracture, the incidence of subsequent fractures within a year of an incident fracture ranged from 4.0% to 35.2%, depending on index fracture type.^[18] The incidence of subsequent fracture within 2 years of an incident fracture was 11%, while 16.6%-41.7% of patients experienced a subsequent fracture within 5 years of an incident fracture.^[19] In our study the frequency of re-fracture in osteoporotic patients was observed in 8.46% (11/130 patients). Our results indicated that Rate of re-fracture was not statistically significant among age groups (p=0.263). Literature suggests that frequency of fracture is associated with severity of osteoporosis and advancing age. It also suggests that as time increases and time between 1st and fracture prolongs then frequency of subsequent fracture decreases.^[20] Our study revealed that the hazard ratio for re fracture was not statistically significant with gender and that difference was less significant than that in first fracture^[21] while death due to fracture for higher in man than woman.^[22,23,24]

CONCLUSION

Fracture is common presentation in osteoporotic bones. Our study showed that rates of re-fracture range up to 8.46% in patients with an initial osteoporotic fracture, depending on the type of initial fracture. This will increase not only hospital stay, but overall cost on one hand and on other side physical, and psychological trauma to community. There is no significant age and gender difference at the time of the re-fracture.

REFERENCES

1. World Health Organization (WHO). Global brief for World Health Day 2012. 2012. http://www.who.int/world_health_day/2012. Accessed April 27, 2014.
2. Koski AM, Patala A, Patala E, Sund R. Incidence of osteoporotic fractures in elderly women and men in Finland during 2005–2006: a population-based study. Scand J Surg. 2014;103:215–21.
3. Johnell O, Kanis JA. An estimate of the worldwide prevalence and disability associated with osteoporotic fractures. Osteoporosis Int. 2006;17:1726–33.

4. Cauley JA, Chalhoub D, Kassem AM, Fuleihan GE. Geographic and ethnic disparities in osteoporotic fractures. *Nat Rev Endocrinol*. 2014;10:338–51.
5. Rachner TD, Khosla S, Hofbauer LC. Osteoporosis: now and the future. *Lancet*. 2011;377:1276–87.
6. Clement ND, Court-Brown CM. Elderly pelvic fractures: the incidence is increasing and patient demographics can be used to predict the outcome. *Eur J Orthop Surg Traumatol*. 2014;24:1431–37.
7. Maharlouei N, Khodayari M, Forouzan F, Rezaianzadeh A, Lankarani KB. The incidence rate of hip fracture in Shiraz, Iran during 2008–2010. *Arch Osteoporos*. 2014;9:165.
8. Berry SD1, Samelson EJ, Hannan MT, McLean RR, Lu M, Cupples LA. Second hip fracture in older men and women: the Framingham Study. *Arch Intern Med*. 2007;167(18):1971–6.
9. Lee KH, Kim JY, Yim SJ, Moon DH, Choi GH, Moon KH. Incidence and risk factors of subsequent hip fractures in Korea: multicenter study. *J Korean Med Sci*. 2014;(7):992–4.
10. Ben Sedrine W, Radican L, Reginster JY. On conducting burden-of-osteoporosis studies: a review of the core concepts and practical issues. A study carried out under the auspices of a WHO Collaborating Center. *Rheumatology (Oxford)* 2001;40(1):7–14.
11. Papaioannou A, Morin S, Cheung AM, Atkinson S, Brown JP, Feldman S. Scientific Advisory Council of Osteoporosis Canada 2010 clinical practice guidelines for the diagnosis and management of osteoporosis in Canada: summary. *CMAJ*. 2010;182(17):1864–73.
12. Melton LJ, Thamer M, Ray NF, Chan JK, Chesnut III CH, Einhorn TA. Fractures attributable to osteoporosis: report from the National Osteoporosis Foundation. *J Bone Miner Res*. 1997;12(1):16–23.
13. Adachi JD, Ioannidis G, Pickard L, Berger C, Prior JC, Joseph L. The association between osteoporotic fractures and health-related quality of life as measured by the Health Utilities Index in the Canadian Multicentre Osteoporosis Study (CaMos). *Osteoporos Int*. 2003;14(11):895–904.
14. Johnell O, Kanis J. Epidemiology of osteoporotic fractures. *Osteoporosis Int*. 2005;16(2):S3–S7.
15. Kanis JA, Johnell O, De Laet C, Johansson H, Odén A, Delmas P, et al. A meta-analysis of previous fracture and subsequent fracture risk. *Bone*. 2004;35(2):375–82.
16. Bliuc D, Alarkawi D, Nguyen TV, Eisman JA, Center JR. Risk of subsequent fractures and mortality in elderly women and men with fragility fractures with and without osteoporotic bone density: the Dubbo Osteoporosis Epidemiology Study. *J Bone Miner Res*. 2015;30(4):637–46.
17. Ahmed LA, Center JR, Bjornerem A. Progressively increasing fracture risk with advancing age after initial incident fragility fracture: the Tromso study. *J Bone Miner Res*. 2013;28(10):2214–21.
18. Song X, Shi N, Badamgarav E, Kallich J, Varker H, Lenhart G. Cost burden of second fracture in the U.S. health system. *Bone*. 2011;48(4):828–36.
19. Curtis JR, Arora T, Matthews RS, Taylor A, Becker DJ, Colon-Emeric C. Is withholding osteoporosis medication after fracture sometimes rational? A comparison of the risk for second fracture versus death. *J Am Med Dir Assoc*. 2010;11(8):584–91.
20. Melton LJ 3rd, Kearns AE. Secular trends in hip fracture incidence and recurrence. *Osteoporos Int*. 2009;20(5):687–94.
21. Yamanashi A, Yamazaki K, Kanamori M, Mochizuki K, Okamoto S, Koide Y. Assessment of risk factors for second hip fractures in Japanese elderly. *Osteoporos Int*. 2005;16(10):1239–46.
22. Nymark T, Lauritsen JM, Ovesen O, Röck ND, Jeune B. Short timeframe from first to second hip fracture in the Funen County Hip Fracture Study. *Osteoporos Int*. 2006;17(9):1353–5.
23. Jun-Il You, Yong-Chan Ha, Ki Soo Park, Rock-Beum Kim, Sung-hyo Seo and Kyung-Hoi Koo. Incidence and mortality of osteoporotic refractures in Korea according to nation wide claims data. *Yonsei Med j*. 2019 Oct 1;60(10): 969–75.
24. Williamson J, Michleff Z and Schneuer F. An 11 year longitudinal analysis of refracture rates and public hospital service utilization in Australia most populous state. *Arch osteoporos* 17,76(2022). <http://doi.org/10.1007/s11657-022-01105-w>

This article may be cited as: Hanif A, Shaikh AA, Jakhrani MR, Bhatti RA, Memon FN, Qureshi W: Frequency of Re-Fracture in Osteoporotic Patients. *Pak J Med Health Sci*, 2023; 17(8): 87–89.