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Effect of Singh's index on peri-operative mortality in Fracture Neck of Femur in elderly patients 60 years and above

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Abstract

Background: Hip fractures in elderly patients are serious injuries that can lead to immobility and permanent dependence, negatively impacting patients' quality of life and resulting in a financial burden for health systems and societies. Hip fractures can also lead to death.

Methods: The present study was conducted in patients with fractures neck of femur (age 60 years and above) presenting to the Department of Orthopaedics, Dr RPGMC Kangra at Tanda. All cases presenting to the department and fulfilling the criteria were studied for a period of one year starting from the date of start of the study.

Results: Bone density measurement by Singh's index shows that none of the patients was in grade 1 and grade 6. Majority of the patients (36%; n=32) were in grade 4 while 27% (n=24) patients each were in grade 3 and grade 5. Remaining 11% (n=10) patients were in grade 2. Our study observed that 50% (n=2) patients each in group A had grade 3 and grade 5 while 67% (n=4) patients in group B had grade 3. Singh's index was found to be comparable between the groups (P=0.344).

Conclusion: We found that singh's index as a measure of bone mineral density does not affect perioperative mortality.

Keywords: Mortality, Hip, Fracture, singh's index

Introduction

Hip fractures in elderly patients are serious injuries that can lead to immobility and permanent dependence, negatively impacting patients' quality of life and resulting in a financial burden for health systems and

societies. Hip fractures can also lead to death.[1] Mortality rates among the elderly following hip fractures range between 14% and 36% within one year of the injury.[2,3] During the first three months after hip fracture, elderly patients have a 5- to 8-fold increased risk of dying.[4] The increased mortality risk persists up to ten years. Because of a predicted increase in life expectancy in western countries over the next decades, hip fractures and their consequences will have an even larger impact on health systems and societies in the future.

Factors that influence prognosis of elderly patients after hip fracture are age, gender, comorbidities, anticoagulation therapy, and general physical health status at the time of injury.[5] Furthermore, timing of surgery is thought to play an important role regarding survival. Although international clinical practice guidelines recommend surgical treatment of acute hip fracture within 24 to 48 hours after admission, these recommendations are still discussed controversially.[6,7] Some researchers argue that early surgery can lead to an increased risk of perioperative complications, including pneumonia, deep venous thrombosis, bleeding, pulmonary embolism, urinary tract infections, and decubital ulcerations because clinicians do not have enough time to optimize patients' medical conditions preoperatively.[8]

Material and Method

The present study was conducted in patients with fractures neck of femur (age 60 years and above) presenting to the Department of Orthopaedics, Dr RPGMC Kangra at Tanda.

All cases presenting to the department and fulfilling the criteria were studied for a period of one year starting from the date of start of the study. The study was initiated following approval from Institutional Ethics Committee. The patients were given the right to abstain from participation in the study or to withdraw at any time of the study without reprisal.

Inclusion criteria

All patients of fractures neck of femur 60 years and above.

Exclusion criteria

1. concomitant trauma involving other systems
2. associated fracture of the pelvis
3. bilateral hip fracture
4. pathological fracture
5. did not give consent to participate in the study

After a detailed history, patients were clinically evaluated at the time of admission. Demographic data of the patients such as age, sex, pre-existing co-morbidities, type of fracture, degree of osteoporosis and type of surgical procedure were recorded.

Bone Mineral Density was evaluated using Singh's Index. The Singh index is commonly used to assess osteoporosis and is based on the radiological appearance of the trabecular bone structure of the proximal femur on a plain anteroposterior radiograph.

Table 1. Grading of Singh's index.

Grade 6	All the normal trabecular groups are visible and the upper end of the femur seems completely occupied by cancellous bone
Grade 5	The structure of principal tensile and principal compressive trabeculae is accentuated. Ward' s triangle appears prominent

Grade 4	Principal tensile trabeculae are markedly reduced in number but can still be traced from the lateral cortex to the upper part of the femoral neck.
Grade 3	There is a break in the continuity of the principal tensile trabeculae.
Grade 2	Only the principal compressive trabeculae stand out prominently, the others have been more or less completely resorbed
Grade 1	Even the principal compressive trabeculae are markedly reduced in number and are no longer prominent.

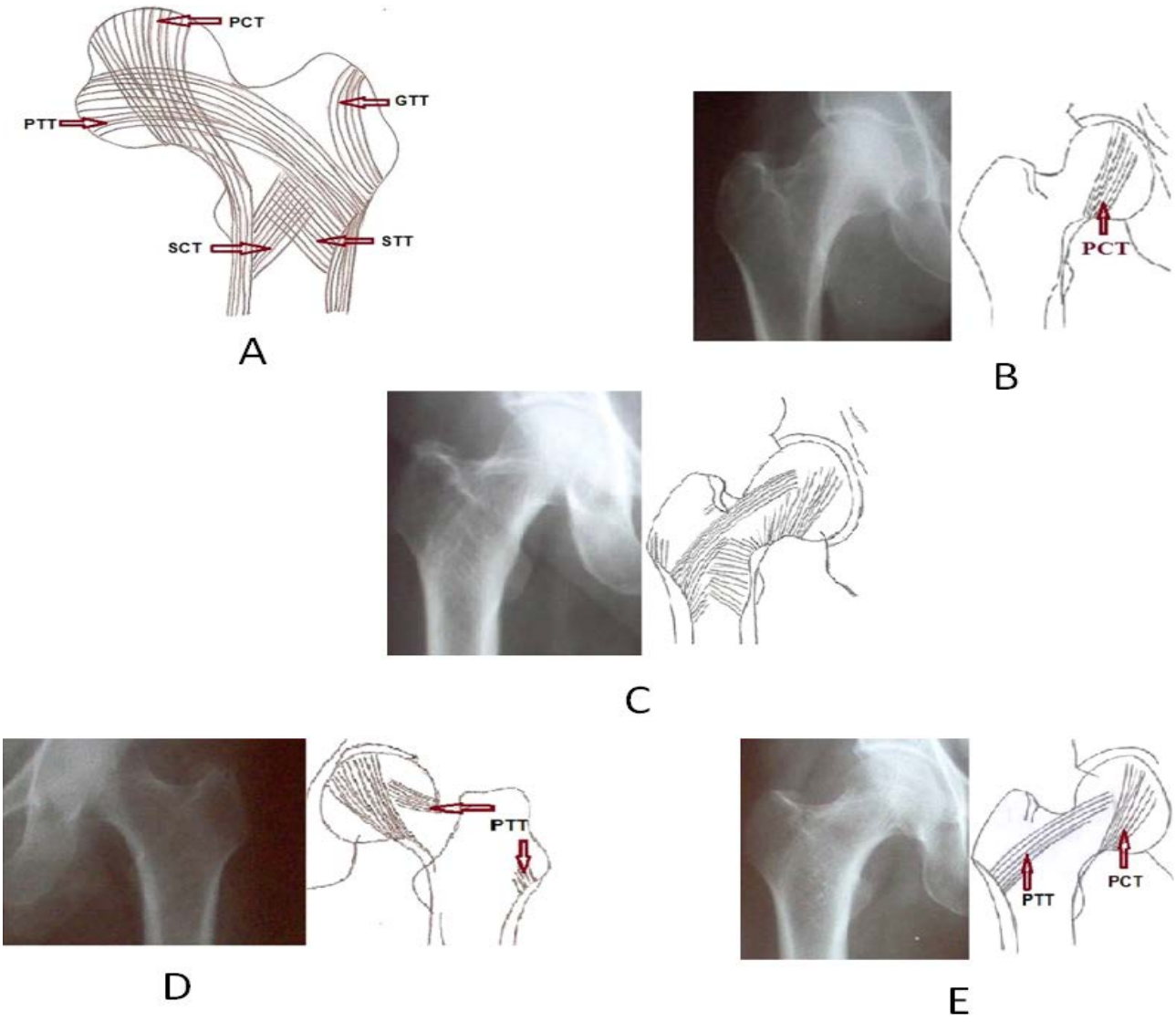

Fig 1:Singh's index [A. PCT – Principal compressive trabeculae, SCT – Secondary compressive trabeculae, PTT – Principal tensile trabeculae, STT – Secondary tensile trabeculae, GTT – Greater trochanter trabeculae.
B: Grade 4 and 5, C: Grade 3, D: Grade 1 and 2, E: Grade 6 (normal)

Statistical analysis

The data were presented as frequency, percentages or mean±SD whereas applicable. Student t-test was used to compare continuous variables between 2 groups. Chi-square test was used to compare categorical variables. P value <0.05 was considered significant. Statistical analysis was performed using SPSS v21.

Results

The present study was aimed to determine peri-operative mortality in fractures of neck of femur in the elderly patients presenting to the Department of Orthopaedics at Dr RPGMC Tanda over the period of one year. A total of 90 patients were included in the study. Results of the study have been described below:

A total of 90 patients with fracture neck of femur were included in the study over a period of one year.

Table given below summarizes Singh's index between different groups. Our study observed that 50% (n=2) patients each in group A had grade 3 and grade 5 while 67% (n=4) patients in group B had grade 3. Singh's index was found to be comparable between the groups (P=0.344).

Table 2: comparison of singh's index between different groups of patients (n=90).

Singh Index	Group A (n=5)	Group B (n=6)	Group C (n=79)	P Value
Grade 1	0	0	0	0.344
Grade 2	0	0	9	
Grade 3	2	4	18	
Grade 4	1	1	30	
Grade 5	2	1	22	

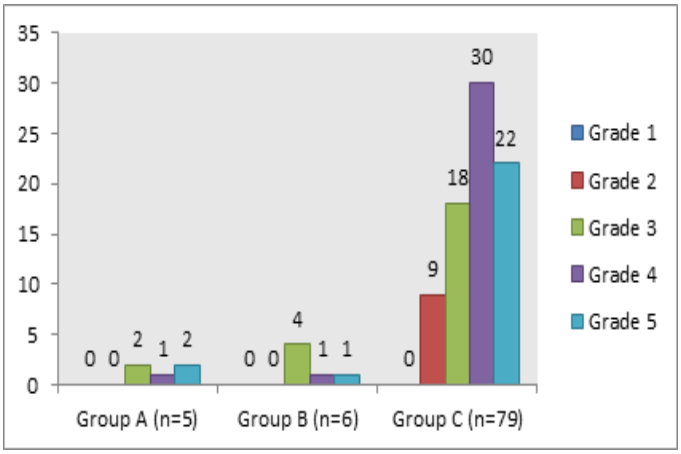

Figure 2: comparison of singh's index between different groups of patients (n=90).

Discussion

The present study was aimed to determine peri-operative mortality in fractures of neck of femur in the patients (age 60 years and above) presenting to the Department of Orthopaedics, Dr RPGMC Kangra at Tanda.

All cases presenting to the department and fulfilling the criteria were studied for a period of one year starting from the date of start of the study. The study was initiated following approval from Institutional Ethics Committee. Patients fulfilling inclusion criteria were evaluated in detail at time of admission. Demographic data of the patients such as age, sex, pre-existing co-morbidities, type of fracture, degree of osteoporosis and type of surgical procedure were recorded.

All data concerning the type of surgery, hospital stay and perioperative mortality was collected. After surgery patients were discharged on the fourth day if the clinical conditions permitted. The telephone number of the investigator was marked on discharge card. The patients were followed up in OPD on the 15th postoperative day for sutures removal and further on 45th and 90th postoperative day for assessment of functional ability.

In our study, age, sex, economic status, BMI, and arm circumference were comparable in the non-survivors and

survived patients. Urea levels were significantly higher in died patients. It has been suggested mortality is significantly influenced by preoperative cognitive state, medical comorbidities and mobility. Dementia, chronic obstructive pulmonary disease, chest infection, heart failure, anemia, abnormal sodium (low or raised), elevated urea, elevated creatinine and malignancy, have all been described as risk factors for increased mortality in the months following a hip fracture. However, in our study only elevated urea levels were observed. Increased urea levels as a predictor of 30-day mortality has been reported earlier by Sheikh et al.[9]

Conclusion

We found that singh's index as a measure of bone mineral density does not affect perioperative mortality.

References

1. Leal J. Impact of hip fracture on hospital care costs: a population-based study. Osteoporos Int. 2015;27:549–58

2. Lyons, A. R. Clinical outcomes and treatment of hip fractures. Am. J. Med. 1997;103:51S–63S

3. Tolppanen A-M, Taipale H, Tanskanen A, Tiihonen J, Hartikainen S. Comparison of predictors of hip fracture and mortality after hip fracture in community-dwellers with and without Alzheimer's disease - exposure-matched cohort study. BMC Geriatr. 2016;16:204

4. Haentjens P. Meta-analysis: excess mortality after hip fracture among older women and men. Ann. Intern. Med. 2010;152:380–90

5. Carpintero P. Complications of hip fractures: A review. WJO. 2014;5:402–11

6. Roberts KC, Brox WT, Jevsevar DS, Sevarino K. Management of hip fractures in the elderly. J Am AcadOrthop Surg. 2015;23:131–7

7. Bhandari M, Swiontkowski M. Management of Acute Hip Fracture. N Engl J Med. 2017;377:2053–62

8. Smektala R. The effect of time-to-surgery on outcome in elderly patients with proximal femoral fractures. BMC Musculoskeletal Disorders. 2008;9:387–9

9. Sheikh HQ, Hossain FS, Aqil A, Akinbamijo B, Mushtaq V, Kapoor H. A Comprehensive Analysis of the Causes and Predictors of 30-Day Mortality Following Hip Fracture Surgery. ClinOrthop Surg. 2017;9:10–18

10. Cummings SR, Black DM, Nevitt MC, Browner W, Cauley J, Ensrud K, et al. Bone density at various sites for prediction of hip fractures. The Study of Osteoporotic Fractures Research Group. Lancet. 1993;341:72-5