

ISSN (P): 2521-3466  
ISSN (E): 2521-3474  
© Clinical Orthopaedics  
www.orthoresearchjournal.com  
2018; 2(3): 117-121  
Received: 24-05-2018  
Accepted: 26-06-2018

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## An epidemiological study of risk of hip fracture subsequent to the earlier Colles fracture in elderly patients

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### Abstract

**Introduction:** Colles' fracture is the most common fracture encountered in the clinical practice and also hip Fracture which is also an old age fracture. Patients usually have moderate trauma like slip and fall on floor. Here in the study we are trying to correlate between colles' & hip fractures (inter-trochanteric, per trochanteric & neck of femur fractures). Can colles' be called as Predecessor or predictor of developing hip fracture in the future.

**Methods:** There are 400 patients who were analyzed retrospectively from June 2015 to June 2018. They were selected depending on the hip fractures and previous history of wrist fractures.

**Results:** out of 400 patients 292(73%) were females, 108(27%) were males. These patients had significant history of previous colles' Fracture following which they had developed hip fractures during the average period of 4 years following colles' fractures. Most of the patients had moderate trauma like slip and fall on floor. Ipsilateral cases were 192(65%) out 292 females, 67(62%) out of 108 males. 126 (43%) of 292 females & 28(26%) of 108 males had co-morbidities (Diabetes, seizures, parkinsonism etc.)

**Conclusion:** our study showed that patients of old age presenting with wrist fractures has to be evaluated for any predisposing factors for & has to be treated and prevented from developing future hip fractures.

**Keywords:** Osteoporosis, Colles' fracture, hip fracture

### Introduction

Hip fractures are commonly seen in elderly age groups, even more common in osteoporotic patients in India<sup>[1]</sup>. And also these fractures were found to be more in frequent occurrence in elderly female patients<sup>[2]</sup>. The rate of occurrence of the colles' fracture is also increasing in elderly which is attributed to the osteoporosis which is again age related. Overall again colles' fracture is most common in all age groups<sup>[3]</sup>. It is said that colles' fracture has an association with increased risks of subsequent hip fractures, also in relation to post-menopausal osteoporosis<sup>[4]</sup>. Women aged over 50 years are also at increased risk of colles' & hip fractures<sup>[5]</sup>. At 50 years for women the lifetime risk is 17.5% for hip fracture, and 16% for Colles' fracture; for men, the respective lifetime risks are 6%, and 2.5%<sup>[6]</sup>. In postmenopausal women, a history of any fracture is an important risk factor for a future hip fracture<sup>[7]</sup>. A new study showed that patients who suffered a Colles' fracture are six times more likely than controls to suffer a subsequent hip fracture<sup>[8]</sup>. Osteoporosis-low bone density leading to fractures after minimal trauma-is a considerable problem in health care because of its potentially severe consequences for both the patient and the health care system if a fracture occurs<sup>[9]</sup>. It has been shown that 16% of women sustaining a hip fracture had previously had a distal radial fracture<sup>[2]</sup>. This suggests that a forearm fracture could indicate a higher risk of having a subsequent hip fracture<sup>[2]</sup>. Fractures of the proximal femur (hip) and distal radius (Colles') are important causes of morbidity among the middle-aged and elderly, especially women<sup>[5]</sup>. They usually occur in association with only moderate trauma, e.g., a fall to the floor<sup>[10]</sup>. As hip fracture, The incidence of Colles' fracture is greater among women than men<sup>[11, 12]</sup>. It has been suggested that a Colles' fracture, as an earlier marker of osteoporosis, might serve as a useful predictor of increased risk for a subsequent hip fracture<sup>[13]</sup>.

**Materials & Methods**

Selection of patient population was done according to the inclusion criteria like- age > 60years, Previous history of wrist fractures, signs of osteoporosis, associated co-morbidity like {Diabetes, seizures, parkinsonism etc.}. This study was conducted as a retrospective study in a tertiary care hospital in a rural setup. For a duration of June 2015 – June 2018 (3 years) for a patient population of 400 who had undergone hip fractures were evaluated for a previous history of fracture of distal end of radius. This in our study was a grey area, where only few patients had x rays of previous fractures for which they were treated. Accordingly all the patients were screened for wrist and hip.

The expected data was collected based on age, sex ratio, predominance of limb involved, average duration for development of hip fracture following colles' fracture, modality of treatment undergone & co morbidity associated.

In our study we got an average of > 80% of patients had association of prior distal forearm fractures following which they developed hip fractures.

During the current stay patient underwent different modality of treatment for their Hip fractures {Inter-trochanteric, per trochanteric & neck of femur fracture = PFN, DHS & hemiarthroplasty respectively}.

**Results**

In this analysis from June 2015- June 2018, among 400 patients 292(73%) patients were females showing female predominance. In this particular group also patients are more in >70 years population. Showing that age is also as significant as osteoporosis. Below are shown the Tabular columns of the results.

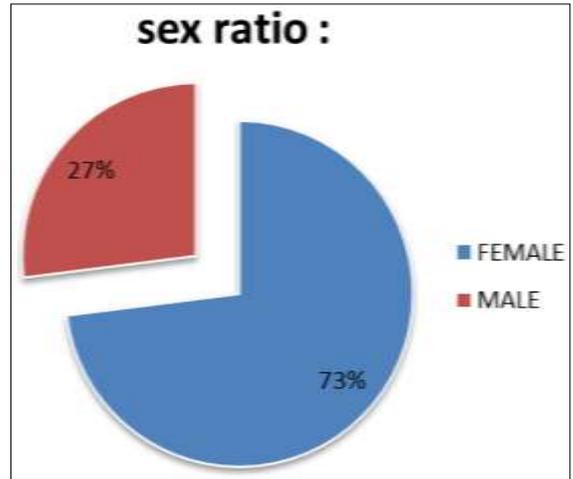


Fig 1

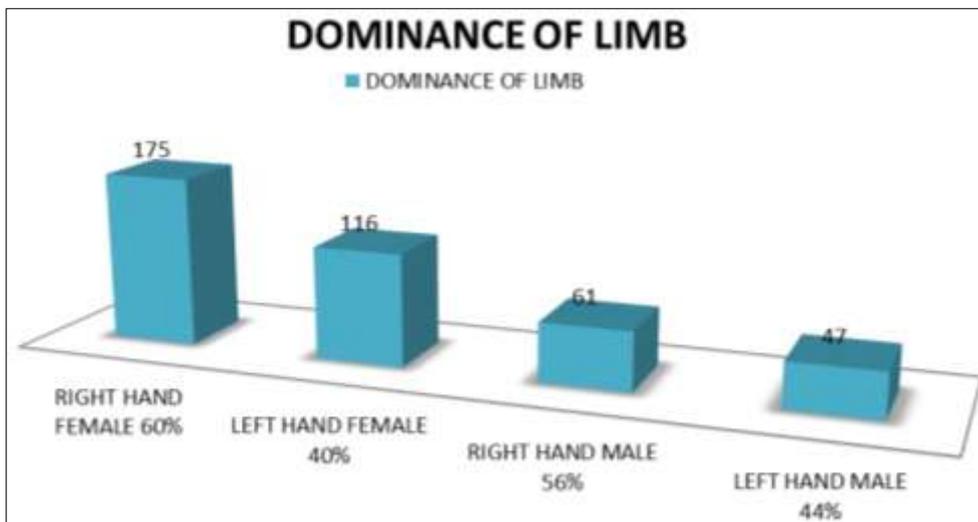


Fig 2

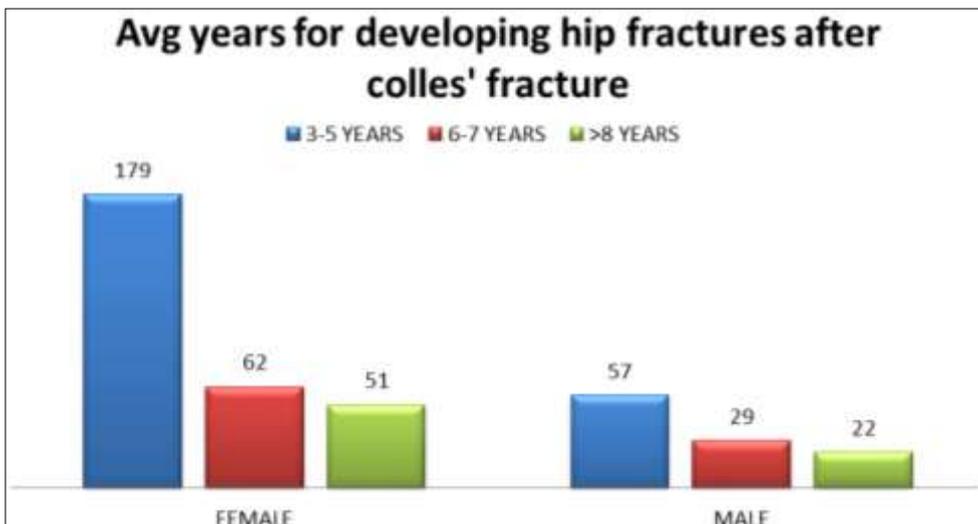


Fig 3

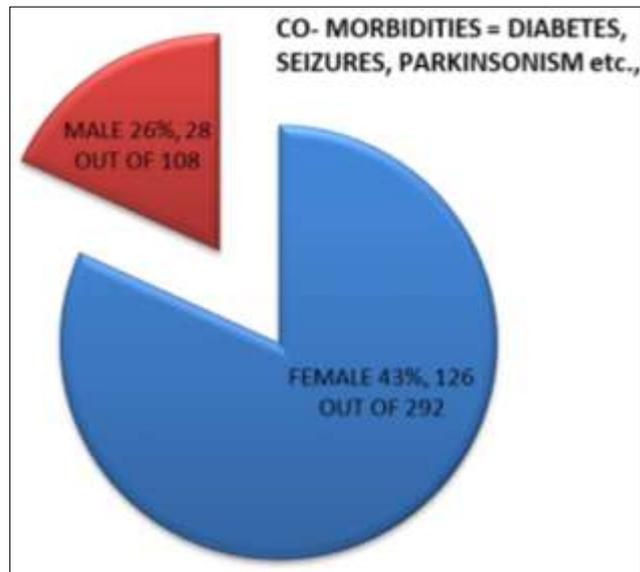


Fig 4

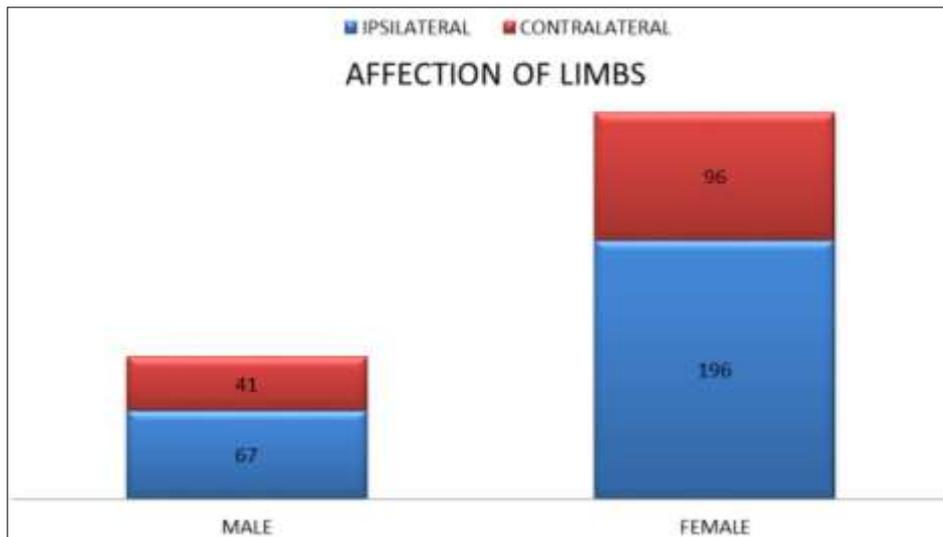


Fig 5

According to schematic representation 1 which shows female predominance, In schematic 2 the dominant limb(right side) was involved more in the colles' fracture development in males and females. In figure 3 which showed most of the patients developed hip fractures like Inter-trochanteric, per-trochanteric & Neck of femur fracture following colles' fracture usually seen between 3 – 5 years of previous Colles' fracture. Study also

shows that co morbidity also increases the risk of fall and hence increases the chances of fractures. Following analysis of figure 5 which again shows that ipsilateral fractures are more frequently seen than contralateral fractures, depicting the dominant side of involvement.

Following are the patients who had hip fractures with colles' fracture:

**Patient 1**



Pre reduction

post reduction



Pre-operative x rays

right Hemiarthroplasty (post-operative x ray)

**Patient 2**



Pre- operative x ray

post-operative x ray.

**Conclusion**

This retrospective study which we are presenting are the most commonly encountered ailments like colles’ & hip fractures, and tried to analyze co-relate between colles’ fracture as a predictor for subsequent hip fracture. This retrospective analysis showed a significantly stronger association in women than men, especially in women who attained menopause. Hence men, women with a history of colles’ fracture should be evaluated for the risk factors and to be treated. Hence in our study we conclude that a relationship between initial colles’ fracture and subsequent hip fracture development exists, and need for preventive measures is mandatory.

**Discussion**

The occurrence of colles’ fracture is important clinically, because of several studies which have shown significant risk for development of the hip fractures [14]. Data’s are also been shown to increase the risk of hip fractures 2 folds higher following colles’ fracture [15]. Hence colles’ fracture should not be ignored [15]. 2 other studies also have shown the increase in hip fractures following colles’ fractures [2, 16]. According to the previous mentioned studies a patient with history wrist fractures especially colles’ fracture have to be evaluated thoroughly for any associated risk factors like old age, osteoporosis, post-menopausal status. According to the risk factors patients have to be treated with calcium supplementation, anti resorptive

measures {bisphosphonates}. Treatment in affordable patients to start them on HIP PADS. Which are protective devices which takes up the impact on collision to the ground. Patients with parkinsonism, seizures fractures are prevented by using Walkers. Draw back for using hip pads are little cumbersome to use and due to the need for assistance for application adherence becomes a problem.

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