

## Assessment of Mortality in Postoperative Hip Fractures in a Rural Tertiary Care Centre

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### Abstract

**Background:** Peritrochanteric hip fractures in elderly people leads to prolonged immobilization and increased risk of death. Elderly people having co morbidities such as diabetes, hypertension and cardiovascular diseases, along with hip fractures results in increase the mortality of the patients post operatively<sup>1,2</sup>. The objective of this study is to determine the relation of mortality during one year post operative period after hip surgery to associated co morbidities.

**Methods:** In this retrospective study patients aged 60 and above admitted during the period from April 2014 to June 2015 in the department of orthopaedics at a rural tertiary care centre for surgical intervention for peri trochanteric hip fractures were included. A sample size of 56 patients operated during this period was considered in this study.

**Results:** Out of 56 patients operated, 9 patients died during first year post operative period. Of them 4 were males and 5 females. 2 patients died in first one month of follow up, one due to aspiration pneumonia and second patient from septicaemia. 3 patients died in first 3 months of follow up due to deep vein thrombosis leading to pulmonary embolism, cardiac failure and cerebrovascular accident. 4 patients died due to cardiac failure between 3 months to one year postoperative period. Out of 9 death 4 were in hospital 3 in home, one in old age home and one person in unknown place. In 9 deaths 3 patients had bipolar prosthesis, 2 dynamic hip screws fixation, 2 with proximal femoral locking compression plate, 2 with proximal femoral nailing and 1 with Austin Moore prosthesis. Death of patients more than 75 years were 5 and between 65-74 years was 4.

**Conclusion:** Hip fractures are one of the common causes of increasing mortality in elderly population. However early recognition of patients with hip fracture and admission to hospital, prompt identification of the co morbidities and treating them with early surgery and mobilization would greatly reduce the risk of morbidity and mortality.

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### Introduction

Peritrochanteric hip fractures are common causes of mortality and morbidity in elderly persons<sup>1</sup>. Hip fractures in elderly makes the patient's bed ridden for long time as they restrict the mobility. Elderly patients more often have co morbidities such as diabetes, hypertension, cardiovascular disease, respiratory disease, neurological disease which along with these factors decreases the life expectancy in elderly<sup>2,3,4</sup>.

Prolong immobility along with hip fractures increases complication such as deep vein thrombosis pneumonia, infection, sepsis, bedsores and heart failure<sup>2,5</sup>. The aims of this present study is to understand the postoperative death and its relation with age, sexuality and associated comorbidities and type of treatment received.

### Aim and objectives of the study

1) Study of mortality rate in Peritrochanteric hip fracture during first year post operative period.

2) To identify the causes which increases risk of mortality in post operative period.

### Materials and Methods

In this retrospective study patients aged 60 and above admitted during the period from April 2014 to June 2015 in the department of orthopedics at tertiary care centre for surgical intervention for peri trochanteric hip fractures in a rural setup in Karnataka were included. A sample size of 56 patients operated during this period was considered in this study.

The data was collected from the patient's Case record form (CRF). A detailed history of illness, past medical history, medical conditions complicating the present illness and detailed clinical examination and relevant investigations were noted down. Patients were followed upto 12 months for this study. All cases of mortality in this postoperative 12 months period was noted down and case sheets were reviewed to note down any cause complicating the peri trochanteric fractures management leading to mortality. Deaths of patients were retrieved from death register and telephonic conversation with the patient's attendants was done.

### Inclusion Criteria:

- Patients with peri trochanteric femur fractures above 60 years of age
- Both high and low velocity injuries

**Exclusion Criteria:**

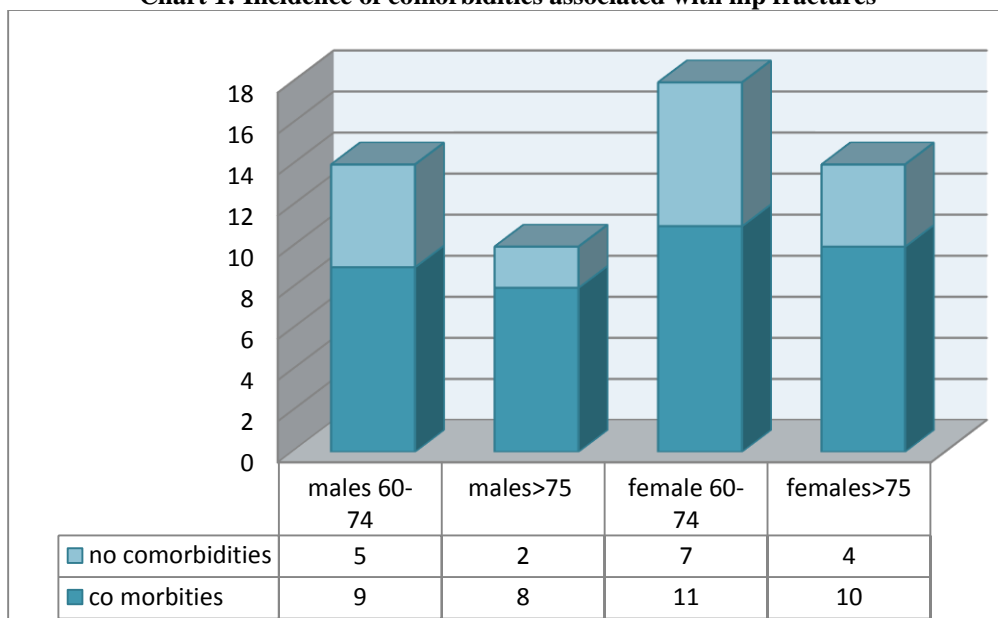
- a) Poly trauma and associated life threatening conditions
- b) Patients who chose conservative treatment
- c) Pathological fractures and open fractures
- d) Medically unfit for surgery

**Results**

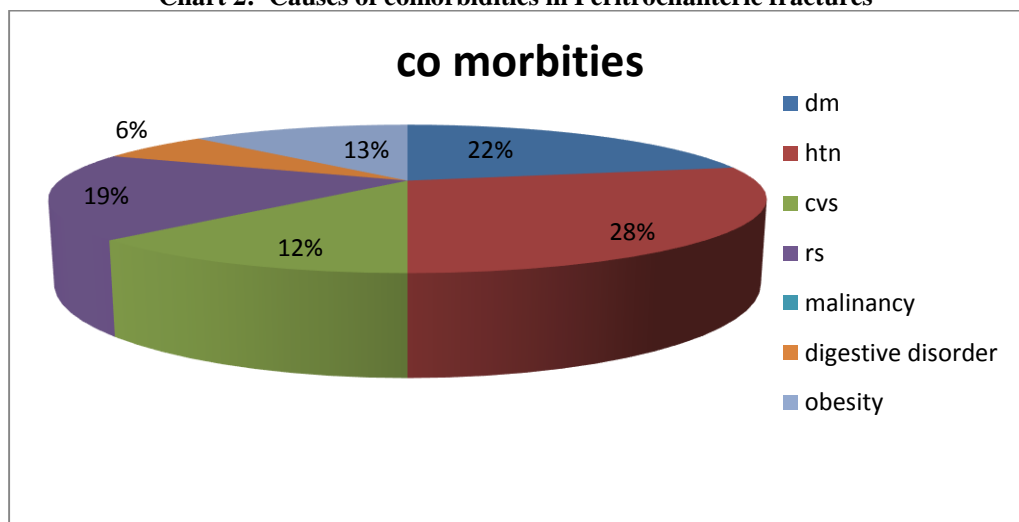
There were 56 patients operated for hip fractures between April 2014 to June 2014 who were more than 60 years of age. Of which 24(43%) were male and 32 (57%) were female each case was followed for period of one year. 32(57%) patients were between 60-74 years and 24(43%) were more than 75 years. Patients with neck of femur fractures were 24,of which male 10(17%) female 14(25%). Peri trochanteric fractures

were 32, in them 15(26%)male and 17(30) females .Patient operated with prosthesis (bipolar and amp) 18(32%), dynamic hip screw (dhs)were 14(25%), proximal femoral nail(pfn) 18(32%) and proximal femur locking plate(pflcp) were 6 (11%). Patients associated with co morbidities were 38(67%) in which diabetes were 32(57%), hypertension were 34(60%), circulatory disease 14(25%), respiratory disease 18(32%) obesity 12(24%) and digestive disease 6(10%). Among these 38 patients 27 were on medication for their following disease. In these co morbidities females were relatively more affected with diabetes, hypertension and obesity than in male's .Males on the other hand had more respiratory and circulatory disease.

**Chart 1: Incidence of comorbidities associated with hip fractures**



**Chart 2: Causes of comorbidities in Peritrochanteric fractures**



Total number of death were 9 in one year postoperative follow up of which males 4 and females 5. 2 patients died in first month of follow up one due to aspiration pneumonia and second patient from septicemia. Of the 3 patients died in first 3 months of postoperative period, one was due to deep vein thrombosis leading to pulmonary embolism, other 2 from cardiac failure and cerebrovascular accident. 4 patients died due to cardiac complications between 3 months to 1 year postoperative period. Death of patients more than 75 years were 5 and between 65-74 years was 4.

Total of 9 death 4 were in hospital 3 in home, one in old age home and one person in unknown place. Of 9 death, 2 patients had got dhs implant, 2 with pflcp and 2 with pfn and 3 with bipolar and 1 with amp prosthesis. Distribution of mortality in first postoperative year of hip fracture management with cause of death

	Age	Sex	Fracture type	Fixation type	co morbidities	Cause of death	Follow up period
1	66	f	It	dhs	Dm,htn,obesity	Aspiration pneumonia	4thday
2	76	m	It	Pflcp	Dm, Htn,copd	Bed sore sepsis	3th weeks
3	81	f	N	bipolar	Dm,htn,chf	Dvtpul embolism	6th weeks
4	62	f	It	pfn	Obesity	Cardiac failure	2th month
5	79	f	N	Bipolar	Htn,obesity	Cerebrovascular accident	4 <sup>th</sup> month
6	75	m	It	Pfn	Copd	Cardiac failure	6 <sup>th</sup> month
7	69	m	N	Dhs	Htn,	Cardiac failure	9 th month
8	71	m	It	Pflcp	Dm,htn,	Cardiac failure	11 <sup>th</sup> month
9	76	f	N	amp	Htn,obesity	Cardiac failure	11 <sup>th</sup> month

it-intertrochantric, n-neck of femur fractures, Pfn – proximal femoral nail, dhs – dynamic hip screw, pflcp-proximal femoral locking plate, amp-austinmoore prosthesis, htn – hypertension, dm-diabetes mellitus, copd-chronic obstructive pulmonary disease

## Discussion

In elderly population there is an increased incidence of hip fracture even with trivial injuries due less bone stock and osteoporosis<sup>4,5</sup>. Peritrochanteric hip fractures are associated with increased death rates postoperatively. Postoperative complications associated with hip fractures are pulmonary embolism, infection and cardiac failure<sup>1,2,3</sup>.

In our present study mortality rates of male patients (16%) are higher than in females (15%) even though female patients had increased incidence of fracture hip. Similar results were seen in few studies such as Wehren LE et al were they conclude men with hip fractures are associated with increased death rates compared to females. Even though no clear cut cause for this has been known, risk factors such as increased incidence of smoking, respiratory diseases, heart disease and decreased physical activities post operatively were more in men in contrast with female patients. These results pointed out men have decreased physiological reserve which may indicate towards high incidence of death<sup>3,7,8,9</sup>.

Death due to heart failure alone increased two fold in post operative period after hip fractures<sup>11,12</sup>. In our study more than half of the deaths were due to heart failure especially after 3 months of follow up. Silber et al. showed that deaths in immediate post operative period is related to patient pre operative comorbidities

and postoperative management like cardiac care and mobilization done in hospital<sup>11,12</sup>. In a study by Myers, A.H et al stated hip fractures in elderly patients i.e. above 90 years of age showed significant increase postoperative heart failure<sup>10,12</sup>. In a study conducted by Roche, J.J et al showed death rates due to heart failure after hip surgery was 65% at 30 days and 92% at 1 year<sup>1</sup>. In our study we could identify 14 patients had altered echocardiogram changes that required additional medications and anticoagulants post operatively. Two factors increased the risk of myocardial infarction one stress and anxiety due to surgery, secondly fluids given preoperatively increased chances of fluid overload and cardiac decompression both of these were precipitating factors for cardiac failure. Hence early and effective triage of cardiac patient's pre and post operatively along with prompt pain management and early surgery can reduce the risk factors mortality.

Second important cause of mortality in hip fractures was respiratory failure. Pneumonia was seen in early post operatively period which is often a curable cause of death<sup>1</sup>. Men are more susceptible for chronic obstructive pulmonary disease<sup>1</sup> due to habits such as smoking and infections of chest are seen with use of steroid and increased age in early post operative period.

In a study conducted by Moja, L., et al results showed a delay of more than 24 hours in operation of a proximal femoral fracture resulted in increased risk of

pneumonia<sup>14</sup>. Prolong immobilization pre operatively leads to more pain which hindered the ability to cough and increased incidence of chest infection<sup>10</sup>. Maxwell, M.J., et al stated few salient methods that could reduce the infection in hip fracture patients like early operative fixation, active pain management, early patient ambulation, regular physiotherapy and exercise, and position of the patient during feeding with 30 degree inclination<sup>14</sup>. Prompt identification subtle signs of subclinical infections preoperatively and patients with high CRP, use of antibiotic judiciously can lower the infection rates and decreases overuse of antibiotics<sup>14</sup>. A Cochrane Review of 21 studies stated that use of prophylactic antibiotics in hip fracture reduced the incidence of both wound and respiratory infection<sup>19</sup>.

Venous thromboembolism(VTE) and massive pulmonary embolism (PE) was the third common cause of post-hip fracture mortality<sup>1,16</sup> Common causes of VTE were surgical delay, prolong immobilization and greater age. Mortality was significantly less when surgical fixation done within 24 hours of fracture and early post operative mobilization<sup>14,16</sup>. Rosencher N et al conducted review of five clinical trials on hip fracture with mechanical prophylaxis to prevent VTE postoperatively stated that rates of deep vein thrombosis reduced but overall no significant change in preventing fatal embolism<sup>17</sup>. At present, most major institutions advocate at least 28 days of post-operative chemical prophylaxis, unless contraindicated.<sup>18</sup>

Patients who are chronically immobilized in stroke and with those with osteoporosis have increased incidence of fall and fractures and are more prone of complications and deaths<sup>19</sup>.

To prevent complications associated with hip fractures recently National Institute Of Clinical Excellence have laid few guidelines for patients with hip fractures [NICE] such as early operative intervention (within 48h), prompt pain management by either regional anaesthesia, optimal analgesia (including nerve blockade), expert surgical experience, choice of surgical approaches and implants, and nursing care and rehabilitation, as priorities in treatment<sup>20</sup>.

NICE recommends early identification of co morbidities and treating the correctable co morbidities such as diabetes, hypertension, volume correction ,chronic heart failure ,chest infections and arrhythmia, anaemia and electrolyte imbalance. Early surgical intervention on the day or day after [within 48hrs of fractures], early mobilization and active physiotherapy and rehabilitation reduce the incidence of death in hip fracture patient.

## Conclusion

Hip fractures are one of the common causes of increasing mortality in elderly population. However early recognition of patients in hip fracture and admission to hospital, prompt identification of the co morbidities and treating them with early surgery and

early mobilization, physiotherapy would reduce the risk of morbidity and mortality of hip fractures. However, these need good health care facilities and good cooperation between primary health centres, community centres and tertiary centres.

**Conflict of Interest: None**

**Source of Support: Nil**

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