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## Epidemiological and etiological factors of various fractures and its pharmacological treatment options in a tertiary care teaching hospital - a prospective cohort study

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### Abstract

A fracture is a broken bone that can range from a thin crack to a complete break bone. A fracture can occur crosswise, length wise in several parts and in too many pieces. Causes of fracture include physical trauma, accidental fall, sports injuries, stress, and osteoporosis. Fractures can be treated with Medications and lifestyle changes. The objective of the study was to identify common types of fractures mostly affected by people, reduce the incidence rate of fractures and to provide patient counseling regarding precautionary measures to avoid accidents and assaults. In the study period, 120 fracture cases were collected, of this 64 (53.33%) are males and 56 (46.66%) are females. Higher incidence of fractures 27 (22.5%) occurred in 50-60 years of age group. Major fractures 48 (47.5%) were occurred due to trauma. 21 (17.5%) were diagnosed by X-rays, 15 (14.5%) patients are diagnosed by CT scan. 22 (18.33%) patients are categorized under femur bone fractures. 52(43.3%) patients were treated with NSAIDS, 33 (27.5%) patients were treated with antibiotics. 29.33% were treated with vitamins and mineral supplements. The study concludes that out of 120 study subjects, major fractures were occurred due to trauma. Clinical pharmacists and other health care professionals intervention to create awareness regarding fractures, medications, lifestyle modifications and other safety measures helps them to recover faster from fractures.

**Keywords:** - Fracture, Trauma, Vitamins and Mineral supplements, NSAIDS, patient counseling

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### Introduction

A fracture is a broken bone that can range from a thin crack to a complete break bone. A fracture can occur crosswise, length wise in several parts are in too many pieces. Causes of fracture include physical trauma, accidental fall, sports injuries, stress, and osteoporosis. Fractures can be treated with Medications and lifestyle changes. The objective of the study is to identify common types of fractures mostly affected by people, reduce the incidence rate of fractures and to provide patient counseling regarding precautionary measures to avoid accidents and assaults. The study was aimed a prospective cohort study on epidemiological and etiological factors of various fractures and its pharmacological treatment options in a tertiary care teaching hospital.

### Methodology

**Study Design:** This is a prospective observational study.

**Study Place:** Government District Hospital, Proddatur.

**Study Duration:** This study was conducted for 6 months, during the year of 2022-2023.

**Sample Size:** The sample size was 120.

### Study Criteria

#### I. Inclusion criteria

- Patients with the age of 20-80 years were included.
- Patients diagnosed with different types of fractures were included in the study.
- Patients of either gender were included.
- Patients who are willing to participate in the study.

#### II. Exclusion criteria

- Patients with the age of below 20 years were excluded from the study.
- Out patients were excluded from the study.
- Personal history of patient was excluded from the study.

### Method

This is a prospective observational study was conducted in Government District Hospital after obtaining approval from institutional ethics committee [SLVP 2022-2023], Sri Lakshmi Venkateswara Institute Of Pharmaceutical

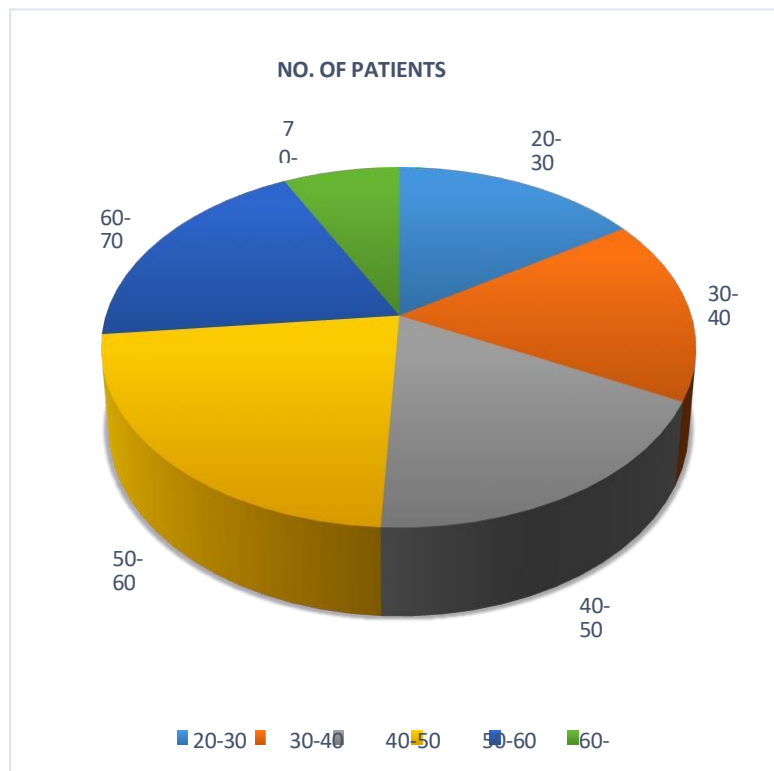
Sciences. After informing about the purpose and details of the study, patient informed consent was obtained by direct patient interview. A specially designed proforma was used for collecting data which includes patient’s demographics, clinical manifestations, diagnosis and prescribed medications for each patient.

**Results and Discussion**

Fractures commonly occur in elderly patients because of relatively weaker points of physis, metaphysis and deteriorated bone quality (Fig. 1). A total of 120 patients were participated in the study, a demographic result male predominance is seen in the study when compare with females, which ranges up to 64(53%) of male and 56 (46%) of female were collected in the study (Fig. 2) (Camillaberg et al., 2020). According to the findings most of the fractures are caused by physical trauma /automobile accidents (Samuel Hailu et al., 2022) i.e., 48 cases of (47.5%) and next category is due to self-fall i.e., 46 cases of (44.8%), 16 patients of (15.83%) fractures due to the osteoporosis and 11 patients of (9.16%) fractures occurs due to assault (Fig. 3).

In the present study, the most common fracture was leg fracture (37%) (Hong Yuan et al., 2022) followed by equal distribution of head fractures (15.83%) and hand fractures, followed by hip fractures (15%), spine fractures (11.6%), knee the least affected (4.16%). According to the study, results shows that out of 120 patients, 22(18.33%) are having femur bone fractures (Table 1 & Fig. 4)) (Sevani singaram et al., 2019).

In the present study, it was observed that the major clinical manifestations of fractures were pain in 64 patients (63.16%) and tenderness in 18 patients (12.5%), immobility in 13 patients (10.83%), fever observed in 11 patients (10.66%), laceration in 7 patients (6.5%) and the least observed symptom is swelling in 6 patients (5.83%) (Table 2). The study also shows that among 120 patients, the most commonly used diagnostic measure for fractures was x-ray for 21 patients (17.5%) followed by CT scan for 15 patients (14.5%) and their diagnostic tests done for patients was hemoglobin in 22 patients (18.3%), differential count for 13 patients (10.83%), RBS for 12 patients (10%), Serum Creatinine for 8 patients (6.66%) , clotting time for 6 patients (5%), and bleeding time, the least diagnostic test done for 5 patients (4.16%) (Table 3). The present work showed that among 120 patients, the treatment regimen given for patients include nonsteroidal anti-inflammatory agents like diclofenac for 52 patients (43.3%), antiinflammatory agents like serratiopeptidase for 37 patients (30.83%) (Umberto Tarantino et al., 2017) antacids like ranitidine for 33 patients (27.5%), calcium supplements given for 28 patients (23.3%) (Ian Baldacchino et al., 2017) B. complex for 27 patients (22.5%), analgesics like tramadol given for 16 patients (13.83%), 3<sup>rd</sup> generation cephalosporins antibiotics like cefotaxime & ceftriaxone given for 14 patients (11.66%), 8 patients (6.86%) respectively, anti-pyretic like paracetamol given for 14 patients (11.66%), proton pump inhibitors like pantoprazole given for 13 patients (10.83%), anti-emetics like ondansetron given for 12 patients (10%), and antibiotics like amikacin given for 11 patients (9.16%) (Fig. 5).



**Fig.1: Age wise distribution**

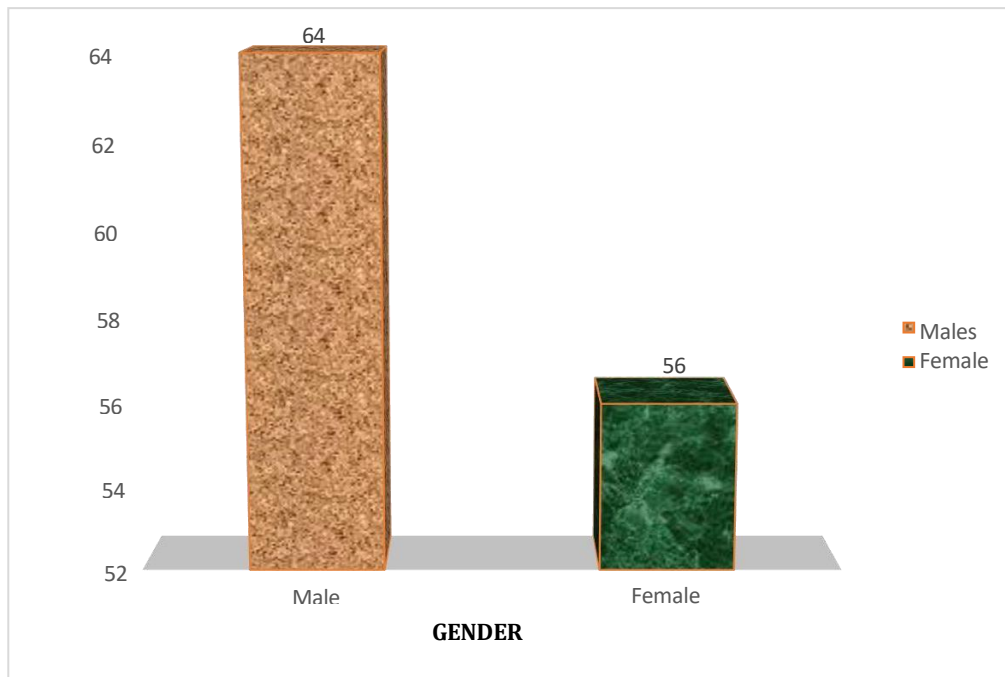


Fig.2: Distribution according to gender

Table 1: Types of Fractures

S.NO	TYPES OF FRACTURES	NO. OF PATIENTS	PERCENTAGE
1.	Hip	18	15%
2.	Head	19	15.83%
3.	Leg	45	37.55%
4.	Hand	19	15.83%
5.	Spine	14	11.66%
6.	Knee	5	4.16%

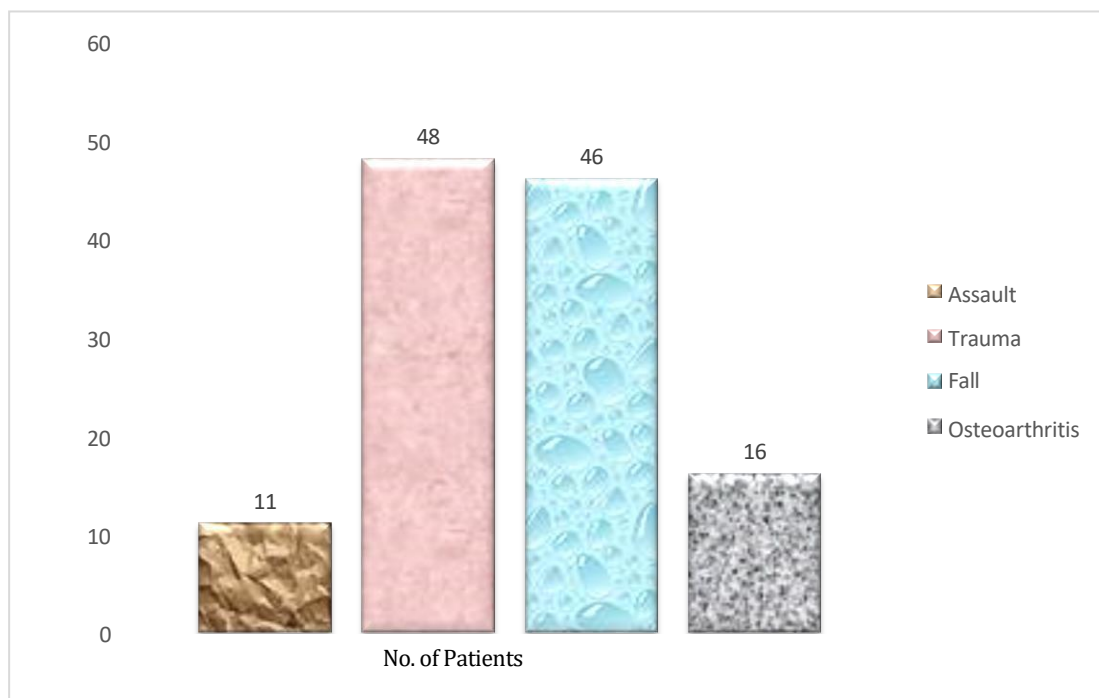
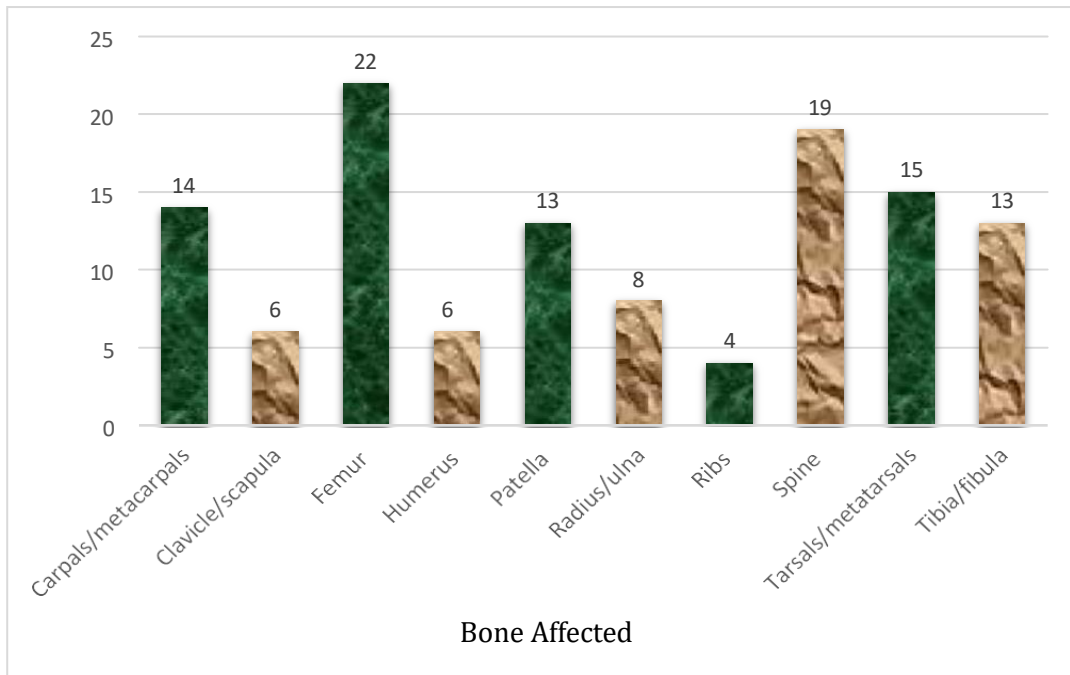


Fig.3: Incidence of Etiology of fractures



**Fig.4: Distribution of types of bones affected**

**Table 2. Clinical Manifestations Of Fractures**

S.No	Laboratory Investigations	No. Of Patients	Percentage
1.	CT-scan	15	14.5%
2.	X-ray	21	17.5%
3.	Hemoglobin	22	18.3%
4.	Differential count	13	10.83%
5.	Random blood sugar	12	10%
6.	Serum creatinine	8	6.66%
7.	Serum Bilirubin	10	9.83%
8.	Clotting time	6	5%

**Table 3. Diagnosis of Fractures**

S.No	Signs & Symptoms	No. Of Patients	Percentage
1.	Fever	11	10.66%
2.	Pain	64	63.16%
3.	Tenderness	18	12.5%
4.	Laceration	7	6.5%
5.	Immobility	13	10.83%
6.	Swelling	7	5.83%

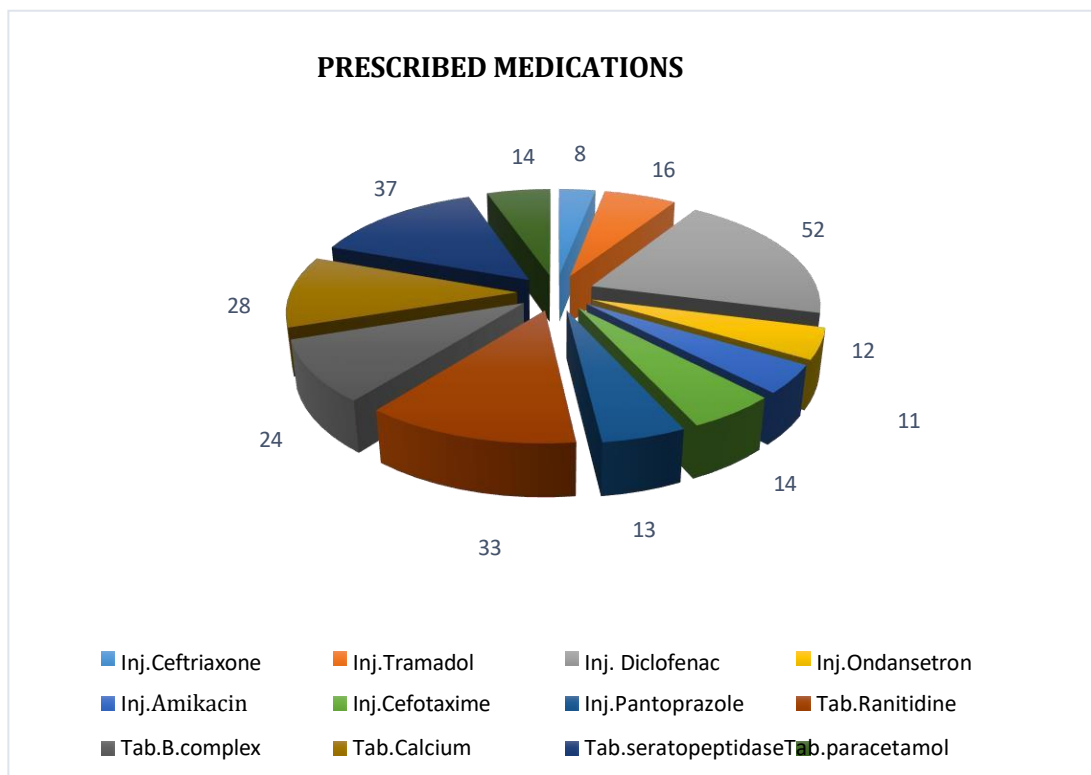


Fig.5: Prescribed Medications

### Conclusion

This study shows that road traffic accidents are still a major cause of different types of bone injuries, Fractures that are occurred due to trauma are rising all time and the middle age group population was most affected. From the results of the study we concluded that there is high prevalence of leg fractures observed in the study population. Males were more affected than females. In this study we found that major cause of fractures were due to trauma. In our study population, X-rays and CT scans were majorly used laboratory investigations for diagnosis of fractures. Medications such as Analgesics, Anti-inflammatory agents, Antibiotics and calcium supplements are used in the treatment of fractures. Clinical pharmacists and other health care professionals should create awareness among the patients regarding types of fractures, Medications, lifestyle changes and safety measures to recover from fractures.

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### Conflict of Interest

The authors declare no conflicts of interest.

### Funding

Nil

### Informed Consent

All the information was gathered by the informed consent by the patients.

### Ethical Statement

Not required

### Author Contribution

All authors are contributed equally.

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