

**EPIDEMIOLOGY AND PATTERNS OF ISOLATED LIMB INJURIES AT A TERTIARY CARE HOSPITAL IN AHMEDABAD** AUTHORS Shah VP<sup>1</sup>, Patel Nisarg<sup>2</sup>, Makwana HD<sup>2</sup>, Patel PR<sup>4</sup>

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**ABSTRACT:**

**INTRODUCTON:** Due to recent advances in technology an increasing number of people suffer from trauma annually which has resulted in change in fracture pattern. As there is a lack of recent systematic trauma registry in India, very little data is available to set up health care facilities.

**AIM:** To determine epidemiology, pattern and initial outcome of patients admitted with isolated limb injury.

**METHOD:** We conducted an observational study on isolated limb injuries without any musculoskeletal disorder at a tertiary care hospital in Ahmedabad from June 2015 to May 2017. The limb injuries were classified as per the Limb Salvage Index score (LSI) for further management.

**RESULTS:**we have included 1300 patients in this study. Mean age was 41.5 years and 68 percent of them were males. Isolated limb injuries showed bi-modal age group with first peak between 21 to 30 years and second at 41 to 50 years. Road traffic accidents were the most common cause of injury followed by fall at home. The most commonly affected bone was femur in lower limb and radius in the upper limb.

**CONCLUSION:** Our study helped in identifying certain features that would be useful for planning preventive strategies, to reduce the numbers of accidents and redirect public investment in health. It also indicates establishment of trauma registry at local, state as well as national level.

**INTRODUCTION:**

Trauma epidemiology is essential to describe the morbidity, disability and dependency as well as defining the most important target for prevention regarding the severity of injury. The prevention of limb injuries is more important necessity for developing nations like India for its economy. It has been previously shown that limb injuries constitute the majority in trauma and road traffic accidents. Generally it involves young and productive persons who are hard core economy of the society, so it is the prime responsibility of the society to prevent such incidents.

Limb injury is the most common injury in younger population and permanent disability affects their quality of life, but Very few studies have been published on it, so we have done our study to evaluate the patients admitted with isolated limb injury.

**Aim:** To evaluate the patients admitted with isolated limb injury for epidemiology, pattern and initial outcome

**Materials and Methods:**

We have included 1300 patients of any age from June 2015 to May 2017 in our observational study.

**Inclusion criteria:**

- 1 The patients having isolated limb injury without any previous musculo-skeletal disorder.
- 2 Isolated limb injuries caused by road traffic accidents, fall from height, fall at home, farm accidents and sports injuries

**Exclusion criteria:**

- 1 Patient with polytrauma or multiple fractures
- 2 Injury other than described above

Data collected in form of age, gender, location and mode of injury, structure involved, operative intervention and initial outcome. Data were collected from case papers and patient or relatives.

**Initial management:** Done according to trauma protocol which varied with the type of trauma encountered.

All patients were immediately assessed and managed for airway, breathing and circulation.

They were given analgesics in form of Inj. Diclofenac sodium or Inj. Tramadol IM/ IV and Inj. Tetanus Toxoid 0.5 Mg IM

Appropriate antibiotics were given as and when required

Once stabilised X-rays of the limb were conducted

**Primary management of fractures:**

Open grade fractures and blood loss were given fast intravenous fluids along with measures to control further blood loss.

Clavicle-Clavicular brace or pouch arm sling

Humerus shaft- shoulder immobilizer or U-slab depending on the area affected.

Reducible distal end radius-Reduced in emergency department and splint was given.

Inter-trochanteric and sub trochanteric femur fractures- primarily by anklet skin traction

Shaft femur- Monitored vitally for shock management due to frequent severe blood loss in such injury. Fluids and blood were started almost immediately by two wide bore IV cannula.

Bohler splint with anklet traction were given before taking X-rays.

Patients in severe shock having complications like fat embolism requiring long term medical care, were managed with upper tibial Steinmanpin traction with one brick and bohler elevation.

Displaced patellar fracture-Aspiration of blood from the knee, RJ bandage with AK-BK (Above Knee and Below Knee) slab and elevation provided.

Closed shaft tibial fractures- AK (Above Knee) slabs Bohler elevation.

Patients, in which operative intervention was not possible immediately, were managed with Calcaneal Steinman pin traction.

Carpal, metacarpal, tarsal,metatarsal and phalangeal fractures- Below elbow(BE) or below knee (BK) slabs with toe rest.



Fig-1 Fracture shaft humerus Fig- 2 Fracture of distal radius



Fig- 3Fracture inter-trochanteric femur Fig- 4Fracture shaft femur



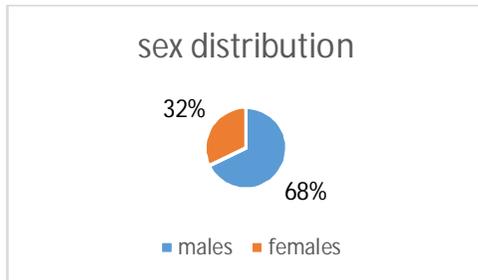
Fig-5 fracture shaft tibia



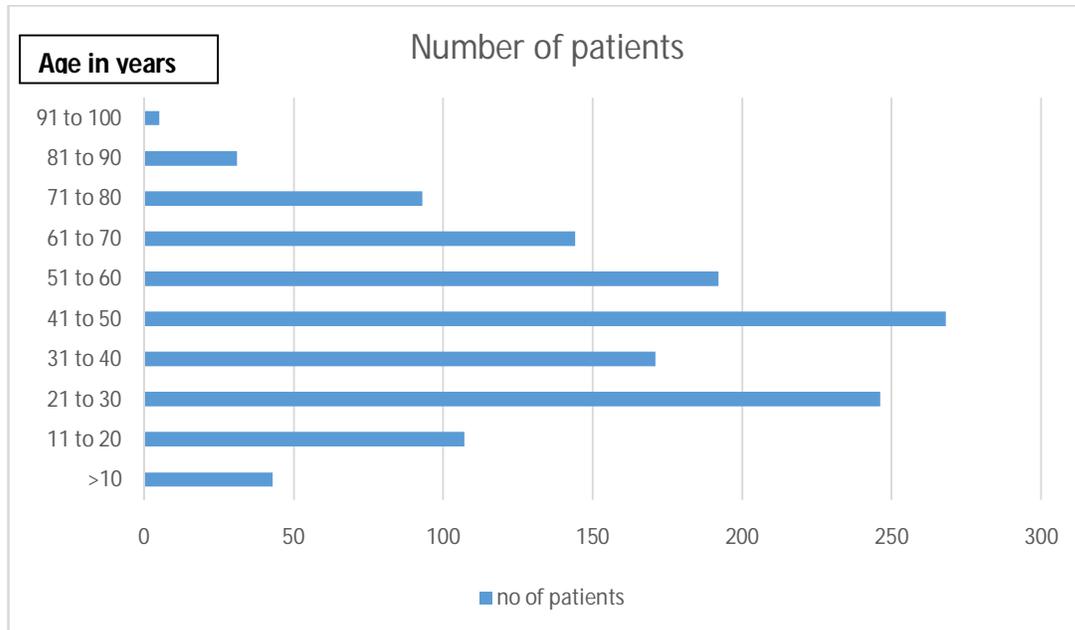
Fig-6 fracture shaft radius ulna

### Results:

Data were collected between June 2015 and May 2017, for 1300 patients, who were victims of isolated limb injuries due to trauma. The mean age of patients was 41.5 years (minimum 5 years and maximum 95 years) with majority being males.



In this study, 68% i.e 884 out of 1300 patients were male and 32% i.e 416 patients were female.



There was bimodal peak, one at 21-30 years of age and the other at 41-50 years of age. Fractures of shaft of long bones like isolated ulna and shaft femur were seen commonly in younger age group while fracture of inter-trochanteric femur, distal radius and femur neck were seen commonly in elderly patients.

**Mode of injury:**

**Table-1 Mode of injury**

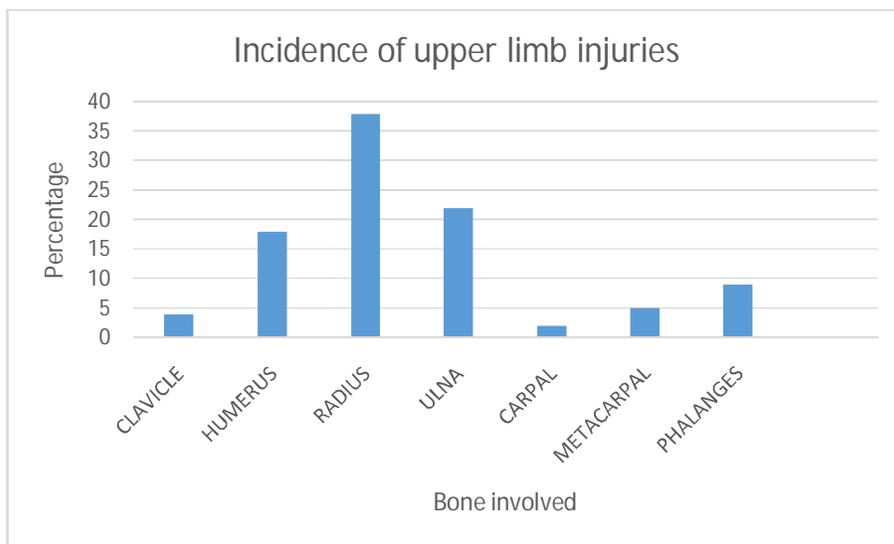
Mode of injury	% of population
Road traffic accident	42
Fall at home	23
Beaten by opposite party	18
Fall from height	10
Sports injuries	04
Farm accidents	03
<b>Total</b>	<b>100</b>

As shown in Table-1 road traffic accident is the most common mode of isolated limb injury followed by beaten by opposite party and fall down at home.

**Table-2 Structure involved in upper limb**

<b>Structure involved</b>	<b>%</b>
Clavicle	05
Humerus	18
Radius	38
Ulna	22
Carpal	02
Metacarpal	06
Phalanges	09
<b>Total</b>	<b>100</b>

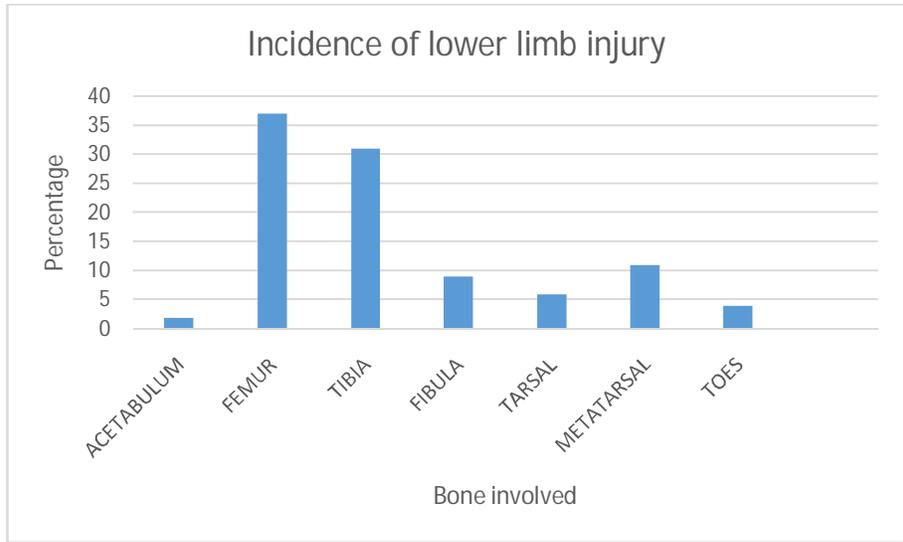
Radius was the most common bone involved followed by ulna.



**Table-3 Structures involved in lower limb**

<b>Structure involved</b>	<b>%</b>
Acetabulum	02
Femur	37
Tibia	31
Fibula	09
Tarsal	06
Metatarsal	11
Toes	04
<b>Total</b>	<b>100</b>

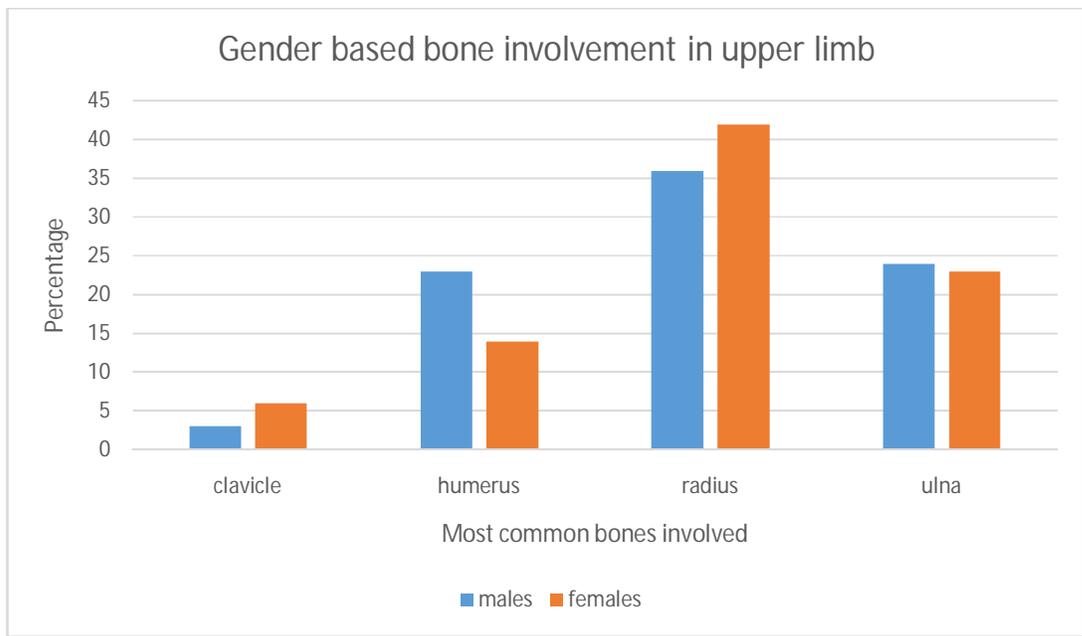
Femur was the most common injured bone (37%) followed by tibia (31%) in lower limb injuries.

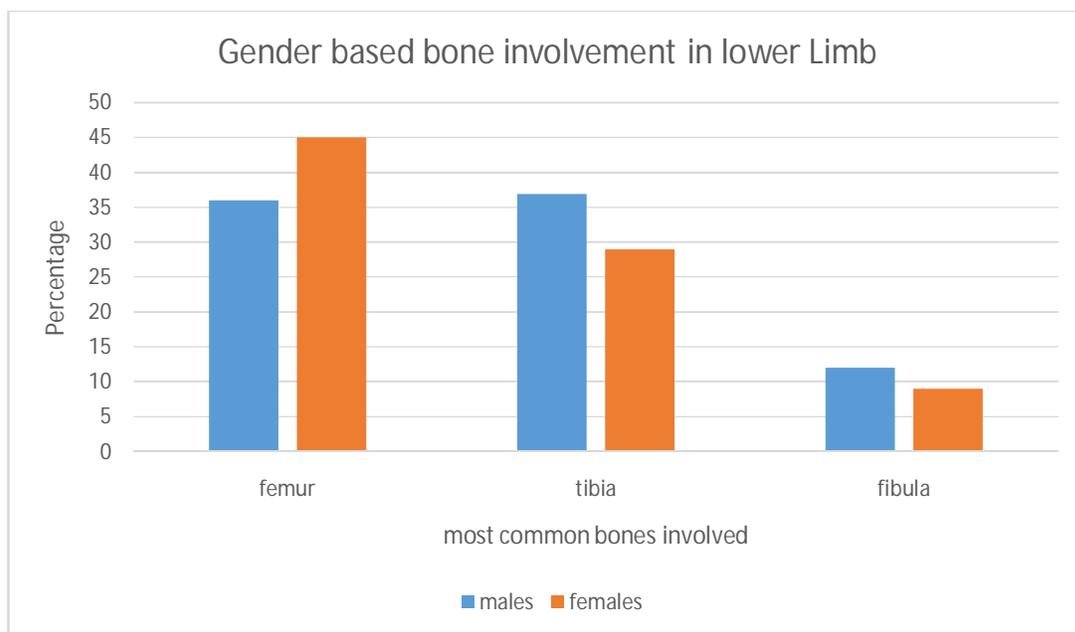


**Gender based bone involvement:**

In upper limb, radius was the most commonly involved bone in male and female both, but involvement rate of radius was higher in female as compared to male.

In female, femur was the most common involved bone in lower limb, which is higher than male. In male the most common involved bone in lower limb was the tibia followed by femur.





### Discussion:

India is a developing nation and Gujarat is one of the fastest developing state in India. With the advent of new scientific advances, architectural designs and modes of transportation, there has been a significant change in the trauma pattern. Recently WHO reported that, by 2020 traumatic injuries will be the third largest killer in developing countries.

Throughout the world, about 3000 people die every day and 30,000 are injured seriously in accidents.

Ahmedabad is a metro city where many young population come for earning purpose. They all are having great transportation and fast life with due stress to meet all demands. It has few tertiary care public hospitals where patients are brought in emergency by the 108 ambulance services. Our hospital is one of them, with dedicated trauma centre. As it is in the centre of the city, easily approachable to nearby places and treatment is provided free of cost in almost all patients majority of the patients with trauma are admitted here. Mostly the patients

brought here are from a radius of around 120 Kilometres, but because of its popularity, patients from remote areas also received quiet frequently in the emergency department.

According to a study carried out in Royal Infirmary of Edinburgh between 2010 and 2011, males have greater incidence of fractures of metacarpals, finger phalanges and ankles while females have higher incidence of fractures of distal radius and proximal femur. This correlates well with the findings of this study which shows higher incidence of metacarpal and ulna fractures in males while distal radius and femur fractures are higher in females. This shows that post-menopausal women are particularly susceptible to fragility fractures in regions of distal radius and proximal femur.

The injury patterns are continuously evolving due to the changing life style. In this study, 42% of the fracture were due to road traffic accidents and 23% due to fall down at home. In the study carried out in Edinburgh the fractures due to road traffic accidents were less than 10%. This shows that in a developing nation like India there is an increased load of fractures due to rash driving particularly in younger population.

## **Conclusion**

According to the mapping of the profile of individuals involving limb injury at the emergency department of our hospital, it was possible to identify some characteristics that may be useful for planning prevention strategies such as the development of protection mechanisms for lower limbs, stimulating the enforcement regarding the compliance of traffic laws by drivers, use of Zebra crossing for crossing roads, speed limit and awareness of safety measures to reduce the numbers of accidents and redirect public investment in health.

In the current era of advanced technology; it is not difficult to set up trauma registry. Such an initiative should be taken by the government to appropriately manage trauma victims. This will further reduce load on economy by avoiding morbidity and dependency.

So our study will provide insight to lots of epidemiologist, emergency physicians, orthopaedic surgeons and further aid for its preventive measures.

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