

Epidemiological Studies On Fractures In Tertiary Care Hospital

Boina Supraja*, Kummari Shiva Kumar*, Dorishetti Harish**, Kattula Rakesh**

* Department of Pharmacy practice, PHARM D,

**Mallareddy institute of pharmaceutical sciences, Dulapally, medchal, Telangana, India.

DOI: 10.29322/IJSRP.10.06.2020.p10228

<http://dx.doi.org/10.29322/IJSRP.10.06.2020.p10228>

Background and objectives: The occurrence of trauma fractures is growing due to increased means of transport, bad roads, and resistance to road safety legislation. Adequate knowledge on the involvement of various parts of the body in trauma will assist in planning for the management of these fractures. This prospective study was performed to determine the etiology and frequency of bones affected.

Patients and methods: The study was designed to be a Prospective and Observational study and was conducted for six months (August 2019 to February 2020) and was conducted in the Department of Orthopedics of Malla-Reddy Narayana Multi-specialty Hospital.

Results: A total of 258 cases were analyzed. The male to female ratio was 2.03:1. The age groups of 21-30 are highly affected which accounted for 28.29% (73 cases). The most common cause for fractures is due to road traffic accidents (motor vehicle and pedestrian) which accounted for 43.19% (111 cases). The most common bone affected was femur which accounted for 22.4 % (58 cases)

Conclusion: This research shows that road traffic collisions are still a major cause of different types of bone injuries. Fractures due to trauma are rising all the time and the middle age group population was the most affected. So this study could help the authorities to design strategies to reduce the incidence of fractures.

Keywords: epidemiology, fractures, age.

INTRODUCTION: Musculoskeletal injuries are a major public health problem globally, contributing a large burden of disability, suffering, and mortality.^[1] The World Health Organization (WHO) global burden of disease estimated that the combined rate of extremity injury from fall and road traffic crashes (RTCs) ranged from 1000 to 2600 people per 100,000 per year in low- and middle-income countries.^[1] The fraction of global death due to injuries was estimated by WHO to be 9.6%.^[2] The most common cause for fracture in India is road traffic accidents. Apart from an increasing urbanization throughout Asia, there has also been an increase in the proportion of the elderly population due to an increase in average life span.^{[3],[4]}

Disregard for safety while driving, working, and performing daily activities can result in physical traumas. Moreover, treatment and rehabilitation are associated with psychological problems, severe morbidities, disabilities, and mental damages. Also, these traumas impose a significant financial burden on individuals and societies.^[5]

Our aim therefore was to investigate the epidemiology of fractures in patients of all age groups of either gender and to evaluate the causes for different types of fractures. Then also to evaluate type of bones affected by cause and to show different type of bones affected according to age groups.

Patients and methods: This was a prospective research conducted for 6 months (August 2019 to February 2020). The inclusion criteria were patients of all age groups of either gender and patients presented with one or more fractures.

The data was collected from the medical records of the patients in orthopedics unit of the hospital. The data gathered include bio data of the patients, history of injury. The injured part of the body was examined and investigated. All these details are recorded in the pro-forma.

Analysis of data was done by using statistical analysis software version 9.4, and the data was presented in frequency tables and graphs.

	GENDER				All	
	F		M			
	N	%	N	%	N	%
AGE						
1-10	3	1.16	1	0.39	4	1.55

Results: During the study period, a total of 300 cases were collected and 258 were included based on inclusion and exclusion. The males are highly affected than females with a ratio of 2.03:1. The middle age group individuals are most commonly affected.

11-20	6	2.33	16	6.20	22	8.53
21-30	17	6.59	56	21.71	73	28.29
31-40	10	3.88	29	11.24	39	15.12
41-50	14	5.43	29	11.24	43	16.67
51-60	16	6.20	17	6.59	33	12.79
61-70	13	5.04	17	6.59	30	11.63
71-80	5	1.94	6	2.33	11	4.26
>80	1	0.39	2	0.78	3	1.16
All	85	32.95	173	67.05	258	100.00

Table 1: Distribution according to gender and age-group.

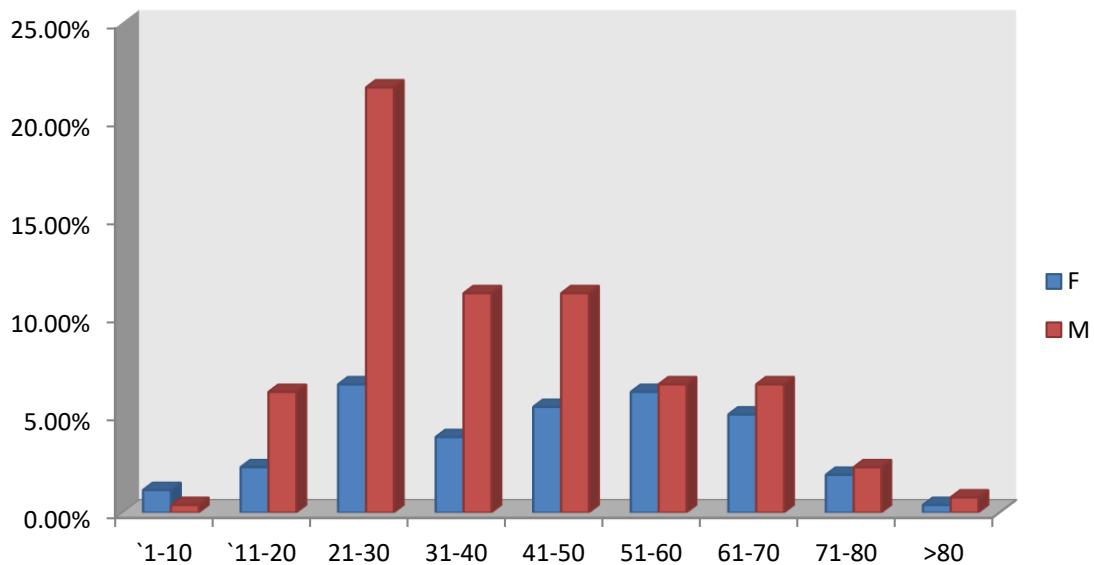


Figure 1: Graphical representation of distribution according to gender and age-group.

In this study, the most common causes for fractures were analyzed, of which fractures due to RTA marked the highest followed by self-skid

CAUSE	FREQUENCY(N)	PERCENTAGE (%)
Assault	14	5.45
Fall From Height	21	8.17
Osteogenesis Imperfecta	3	1.17
Pedestrian	14	5.45
Motor vehicle	97	37.74
Self Skid	63	24.51
Sport	16	6.23
Work Site	29	11.28

Table 2: Etiology of fractures seen the study.

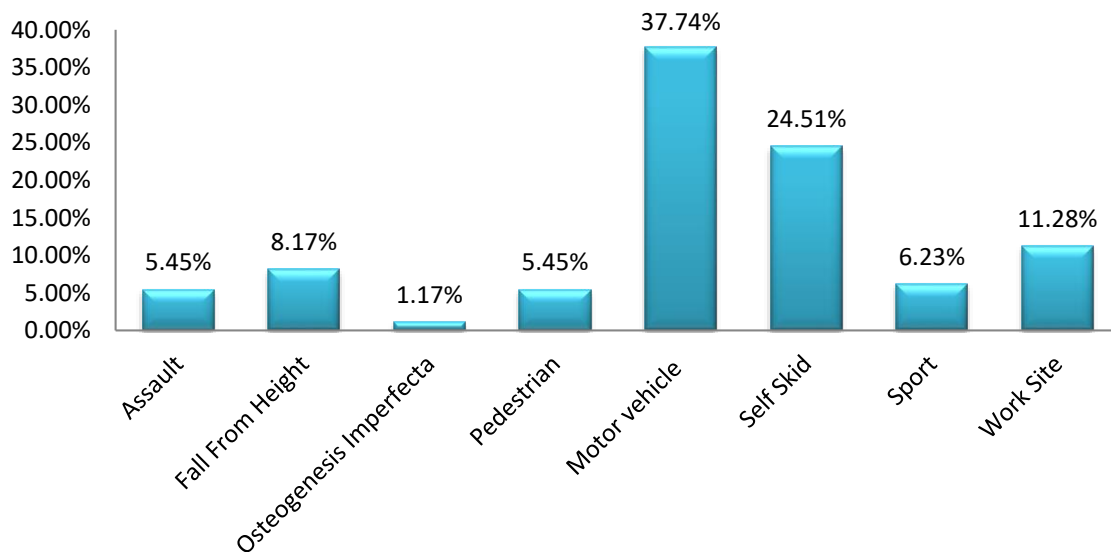


Figure 2: Graphical representation of Etiology of fractures.

In this study, the bones affected were analyzed, of which femur marked the highest followed by multiple bones (i.e. two or more bones).

BONES AFFECTED	FREQUENCY(N)	PERCENTAGE (%)
Ankle	14	5.43

Carpels/Meta-carpels					10					3.88
Clavicle/Scapula					11					4.26
Femur					58					22.48
Humerus					26					10.08
Multiple bones					48					18.61
Patella					17					6.59
Pelvic					17					6.59
Radius/Ulna					14					5.43
Ribs					1					0.39
Spine					10					3.88
Tarsals/Meta-tarsals					3					1.16
Tibia/Fibula					29					11.24
Total	14	21	3	14	97	63	16	29		257

Table 3: Distribution of different types of bones affected in the enrolled subjects.

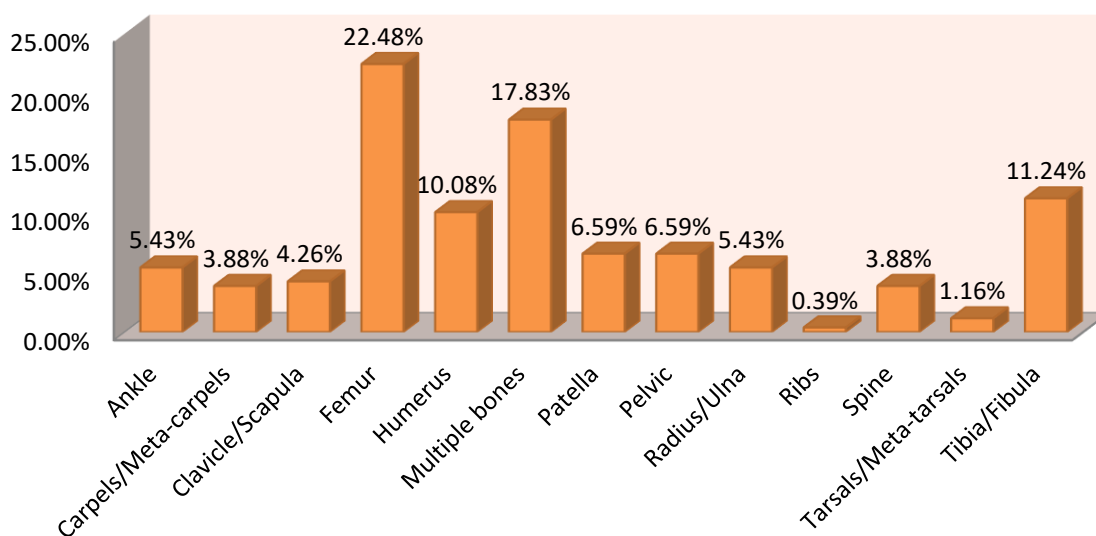


Figure 3: Graphical representation of types of bones affected in the study.

Type and number of bones affected by cause	ASSAULT	FALL FROM HEIGHT	OSTEOGENESIS IMPERFECTA	PEDESTRIAN	MOTOR VEHICLE	SELF SKID	SPORT	WORK SITE	Total
ANKLE	0	2	0	1	3	7	0	1	14
CARPELS/ METACARPELS	0	0	0	1	1	5	2	1	10
CLAVICLE/ SCAPULA	0	0	0	1	7	0	2	1	11
FEMUR	1	3	0	2	18	27	2	5	58
HUMERUS	5	3	0	0	11	4	1	2	26
MULTIPLE BONES	1	5	2	1	22	9	4	4	48
PATELLA	0	3	0	3	4	0	3	3	16
PELVIC	0	1	0	1	4	8	0	3	17
RADIUS/ULNA	3	0	0	2	6	0	1	2	14
RIBS	0	0	0	0	1	0	0	0	1
SPINE	1	4	1	0	3	0	0	1	10
TARSALS/ METATARSALS	0	0	0	1	1	0	0	1	3
TIBIA/FIBULA	3	0	0	1	16	3	1	5	29

This

Table 4: Showing different types and number of bones affected by cause.

study has shown that the most common cause for femur fractures was self skid. While motor vehicle was the most common cause for multiple bones, humerus, clavicle/scapula, patella, radius/ulna, ribs, tibia/fibula as shown in **table 4**.

In this study, distribution of bones affected according to age group was analyzed, in which age group (18-50) is highly affected with N=174 and percentage affected is 67.70% and in this age group patients femur(13.23%) is the most affected bone followed by multiple bones(12.84%) as shown in **table 5**.

Distribution of bones affected according to age group	AGE						All	
	1-17		18-50		>50		N	%
	N	%	N	%	N	%		
BONES AFFECTED	.	.	7	2.72	7	2.72	14	5.45
ANKLE								
CARPELS/METACARPELS	1	0.39	7	2.72	2	0.78	10	3.89
CLAVICLE/SCAPULA	1	0.39	7	2.72	3	1.17	11	4.28
FEMUR	.	.	34	13.23	24	9.34	58	22.57
HUMERUS	1	0.39	17	6.61	8	3.11	26	10.12
MULTIPLE BONES	3	1.17	33	12.84	12	4.67	48	18.68
PATELLA	.	.	15	5.84	1	0.39	16	6.23
PELVIC	.	.	8	3.11	9	3.50	17	6.61
RADIUS/ULNA	.	.	12	4.67	2	0.78	14	5.45
RIBS	.	.	1	0.39	.	.	1	0.39
SPINE	.	.	8	3.11	2	0.78	10	3.89
TARSALS/METATARSALS	.	.	3	1.17	.	.	3	1.17
TIBIA/FIBULA	1	0.39	22	8.56	6	2.33	29	11.28
TOTAL	7	2.72	174	67.70	76	29.57	257	100.00

Table 5: showing incidence of bones affected by age group

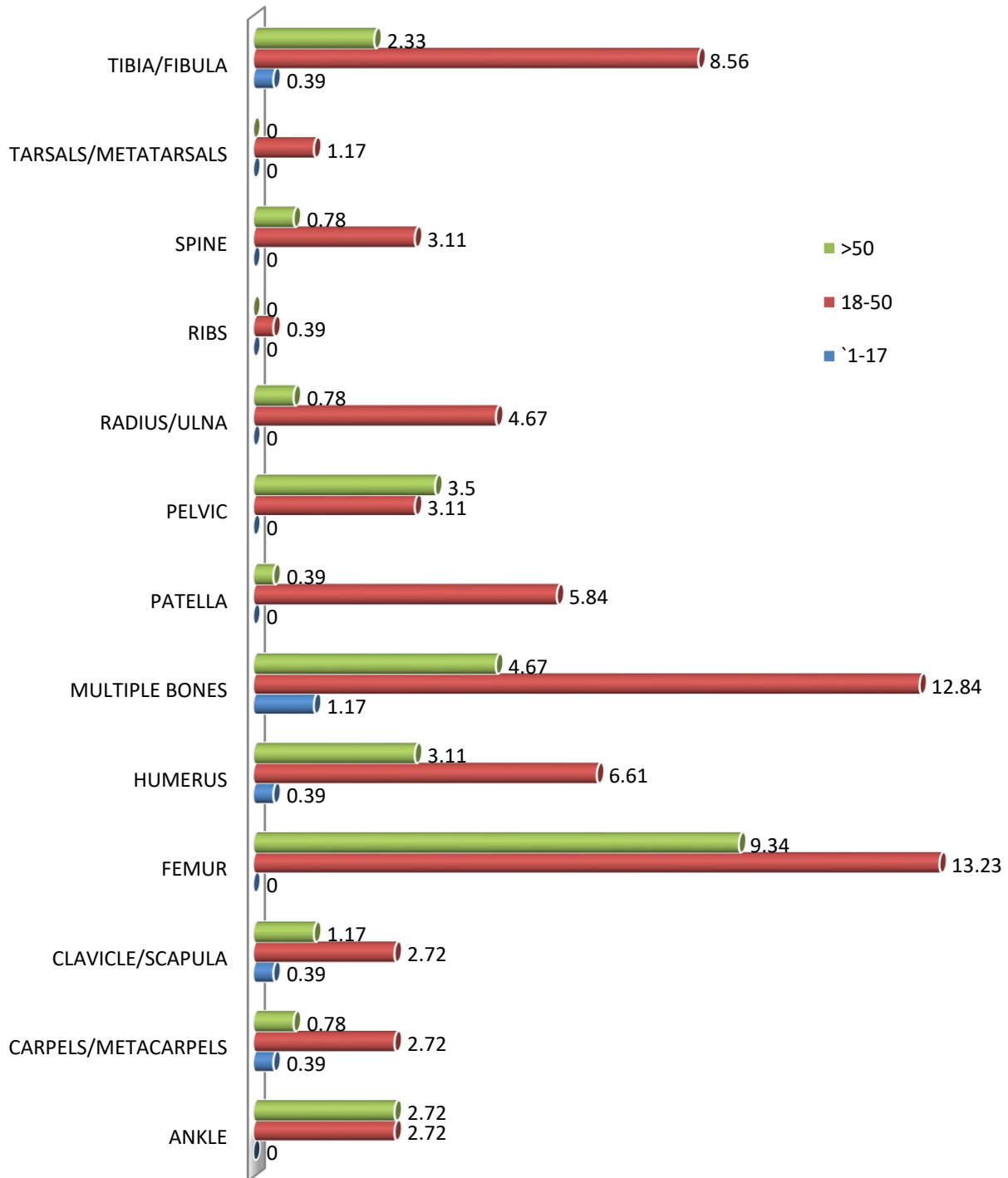


Figure 4: Graphical representation of distribution of bones affected according to age group.

In this study, Incidence of causes of fractures according to age group was analyzed, in which age group (18-50) is highly affected with N=174 and percentage affected is 67.70% and these age group individuals are mostly affected due to motor vehicle accidents(28.40%) followed by self-skid(10.89%). In the age group (>50) individuals are mostly affected due to self-skid (13.23%).

Incidence of causes of fractures according to age group	AGE						All	
	1-17		18-50		>50			
	N	%	N	%	N	%	N	%
CAUSE								
ASSAULT	.	.	14	5.45	.	.	14	5.45
FALL FROM HEIGHT	.	.	16	6.23	5	1.95	21	8.17
OSTEOGENESIS IMPERFECTA	2	0.78	1	0.39	.	.	3	1.17
PEDESTRIAN	.	.	13	5.06	1	0.39	14	5.45
MOTOR VEHICLE	1	0.39	73	28.40	23	8.95	97	37.74
SELF SKID	1	0.39	28	10.89	34	13.23	63	24.51
SPORT	2	0.78	11	4.28	3	1.17	16	6.23
WORK SITE	1	0.39	18	7.00	10	3.89	29	11.28
All	7	2.72	174	67.70	76	29.57	257	100.00

Table 8: Incidence of causes of fractures according to age group.

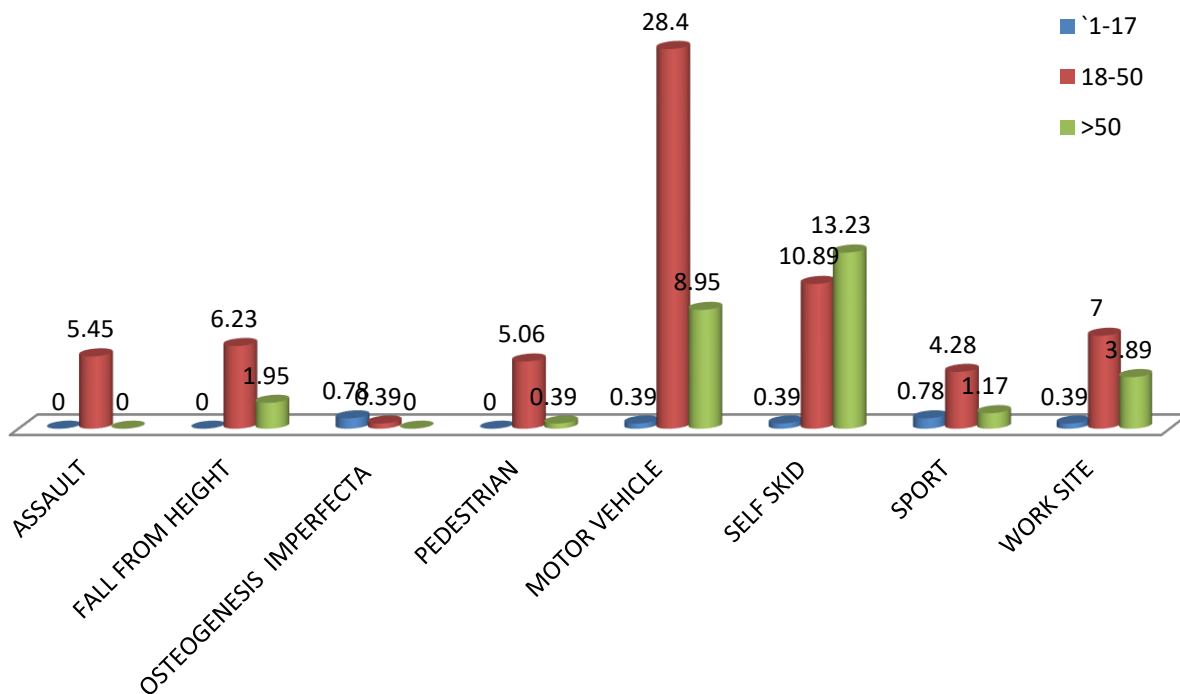


Figure 7: Graphical representation of incidence of causes of fractures according to age group.

Discussion:

By gender-wise distribution, it was revealed that male predominance over female patients. These findings show that males are more involved in rigorously and risky activities than females. This finding is similar to those reported by thanni and kehinde and nigm et al. in nigeria.^[6]

By correlating age and gender it was found that males of age group 21-30 accounted for the highest number of fractures 21.71% followed by age group 31-40(11.24%) and 41-50(11.24%). In females, 21-30 age group individuals have the highest proportion of 6.59% followed by 41-50 age group individuals of 6.20%.

In this study it is seen that fractures of long bones of lower-limbs accounted for 33.72% of all the fractures. These findings are not similar to those reported by Ebong in ibadan where upper-limb fractures were more common than the lower limb fractures.^[7]

The femur is usually at high risk of fracture in road traffic accidents and self skid accounted for 58(22.48%) followed by multiple bones i.e. either two or more bones affected in trauma, with a proportion of 48(18.61) and tibia/fibula accounted for 29(11.24%), Humerus 26(10.08%), Patella 17(6.59%), pelvic 26(10.08%), Ankle 14(5.43%), radius/ulna 14(5.43%), clavicle/scapula 11(4.26%), spine 10(3.88%), carpels/metacarpals 10(3.88%), tarsals/metatarsals 3(1.16%), ribs 1(0.39%).

In this study it is seen that the most common cause for major fractures was due to road traffic accidents and this accounted for 43.19%. This may be due to an increase in means of transportation, bad roads and avoiding or unfollowing traffic signals, hence there is a need for trauma prevention by implementing strict traffic rules and providing better roads. This finding is nearly similar to that reported by solaberu et al.^[8]

Motor vehicle accidents are the common cause for major fractures accounted for 97(37.47%), self skid 63(23.51%), worksite 29(11.28%), fall from height 21(8.17%), sports injury 16(6.23%), assault 14(5.45%), pedestrian 14(5.45%), osteogenesis imperfecta 3(1.17%).

By correlating age group with types of bones affected it was found that femur (13.23%) is the most affected bone in 18-49 age group individuals followed by multiple bones(12.84%). Next to it, also femur is the most affected bone in greater than 50 age group individuals. In 1-17 age group individuals multiple bones are affected with a proportion of 1.17%.

By correlating age group with type of cause it was found that motor vehicle accidents (28.4%) are the most common cause for fractures in 18-49 age group individuals followed by self skid(10.89%). But in individuals in the age group greater than 50 years, self skid(13.23%) is the most common cause for fractures. This may be due to carelessness and decreased strength in older age individuals. Sport injury(0.78%) and osteogenesis imperfecta(0.78%) are the common cause for fractures in 1-17 age group individuals.

Conclusion: In this study, the overall incidence of fractures and the etiology of fractures have been identified. These findings suggested that particular prevention programs are needed to decrease the incidence of fractures.

The frequency of patients with the most common type of bone affected(femur) and cause of fracture(RTA) admitted in orthopedic ward of the hospital was gradually increased in males and females of age-group(18-50) individuals which constitutes the major workforce of the country and this will cause a great loss to the family as well.

The major cause of fractures in elderly patients of either gender is due to self-skid. So proper care should be taken while moving around and relevant diet plans should be followed to maintain required bone density.

So this study could help the authorities to design strategies to reduce the incidence of fractures. We also believe that this study would serve as a template for future health care planning towards the management of these fractures.

Reference:

1. Mock C, Cherian MN. The global burden of musculoskeletal injuries: Challenges and solutions. Clin Orthop Relat Res 2008;466:2306-16.

2. Murray CJ, Vos T, Lozano R, Naghavi M, Flaxman AD, Michaud C, *et al.* Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990-2010: A systematic analysis for the Global Burden of Disease Study 2010. *Lancet* 2012;380:2197-223.
3. Patel M.C., Chandra M., Lo J.C. Mortality following hip fracture in Chinese, Japanese, and Filipina women. *Am J Manag Care.* 2016;22:e358–e359.
4. Kannus P., Parkkari J., Sievänen H., Heinonen A., Vuori I., Järvinen M. Epidemiology of hip fractures. *Bone.* 1996;18(1 Suppl):57S–63S.
5. Samieirad S, Tohidi E, Shahidi-Payam A, Hashemipour MA, Abedini A. Retrospective study maxillofacial fractures epidemiology and treatment plans in Southeast of Iran. *Medicina oral, patologia oral y cirugia bucal.* 2015 Nov;20(6):e729.
6. Babalola OM, Salawu ON, Ahmed BA, Ibraheem GH, Olawepo A, Agaja SB. Epidemiology of traumatic fractures in a tertiary health center in Nigeria. *Journal of Orthopedics, Traumatology and Rehabilitation.* 2018 Jul 1;10(2):87.
7. Ebong WW. The pattern of fractures and dislocations in Western Nigeria. *Injury* 1978;9:221-4.
8. olagberu BA, Adekanye AO, Ofoegbu CP, Kuranga SA, Udofia US, Abdur-Rahman LO, *et al.* Clinical spectrum of trauma at a University Teaching Hospital in Nigeria. *Eur J Trauma* 2002;28:365-9.)