



Epidemiology of orthopedic trauma admissions in a multispecialty hospital in Warangal-A retrospective study

Abstract

Introduction: To analyze the spectrum of orthopedic admissions was the aim of this study. There are multiple other reasons besides fracture for which a patient could potentially be admitted to orthopedic inpatient care.

Materials and Methods: One-year registry data of orthopedic admissions was used to analyze the spectrum of admissions. This study was performed at a tertiary level multispecialty Warangal based on patients admitted for orthopedic inpatient care.

Results: 1020 patients were joined over the one year period. These patients having an average age of 41. 14 years with a gender-wise ratio of 61:39 Male to Female.

There were (330) lower limb fractures, upper limb fractures (91), (14) Neck fractures, (3) cellulitis, (112) cervical PIVD (Prolapsed Inter Vertebral Disc), lumbar PIVD (173), cervical and lumbar (53), (104) implant removal, head injury (117), (19) chest and abdomen injury, spine (2) and with (2) admissions not specified due to coding.

Conclusion: Our results showed a rising incidence of orthopedic fractures in adult males, which is not matching out the previously reported fractures in older and young people. For the most reason for orthopedic admissions were fractured, accounted more than 2/3 of the total admissions. Biasness in gender admission reflects true picture of male-dominated society and the lower limb fractures were dominating in our study.

Keywords: epidemiology, fracture, infection, orthopedics, trauma, PIVD (Prolapsed Inter Vertebral Disc)

Introduction

There is a change in the criteria of patients who were joined in the health care unit for a fracture or other orthopedic trauma. Complications from past operations, mostly replacement of knee or hip are increased with resultant increase in the number of osteoporotic fractures. There are few papers looking at all orthopedic trauma admissions focusing on purely fracture epidemiology [1-3].

Worldwide traumatic injuries pose a significant and increasing challenge to healthcare systems [4]. Traumatic injuries are one of the main causes of mortality in the world, with 90% of the injuries estimated to occur in low and middle-income countries according to the World Health Organization (WHO) [5]. A huge number of traumatic injuries are orthopedic in nature. Injuries that cause damage to the musculoskeletal system, which includes

bones, ligaments, joints, tendons, muscles, and nerves, are defined as orthopedic injuries [6]. We can categorize orthopedic injuries into traumatic and non-traumatic injuries. Fractures being the most common injury Furthermore, studies generally show that orthopedic injuries predominantly affect younger male adults [7,8]. In low and middle-income countries a limited number of studies have been conducted on the epidemiology of traumatic orthopedic injuries.

With a prevalence of 21.8% [8] and 35.1% [9] studies have shown that falls are the second most common determinant of traumatic orthopedic injuries.

With a prevalence of 63.6% [8] and 39.1% [9] studies have shown that Road Traffic Accidents (RTAs) are the most common determinant of traumatic orthopedic injuries. RTAs are the most common determinant of fractures, with a prevalence of 29.4%, [10]

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49.3% [11] and 68.4% [12] reported by some researchers. Similarly, falls have been shown to be a serious public health problem worldwide [13,14]. To determine the demographic profile, prevalence, and determinants of traumatic orthopedic injuries this study was conducted with the specific objective.

Fractures make up the majority of the reason for which a person is admitted to the orthopedic department as inpatient but there are also many other problems like tumors, infections, deformities, etc. which may necessitate admission [15]. 9% of global mortality accounts trauma for these days and is a threat to health worldwide [16]. In South East Asian countries Road Traffic Accident (RTA) lies amongst top five causes of morbidity and mortality [17]. In patient care not only for trauma, lots of patients with, bone tumor, bone pain, bone infection, congenital or post-trauma deformity, post-burn contracture, etc. also essential.

This study aims to give a snapshot of patterns of orthopedic injuries and admissions in the hope that it will aid all orthopedic doctors and paramedical personnel involved in the care of these patients to maintain a standard treatment protocol along with proper planning for better care. This will also help the team to keep high index of suspicion with regards to the possibility of other associated fractures or system involvement so that these can be identified and treated promptly. To manage resources, plan training opportunities and predict areas, where allocation of resources could improve patient care within the constraints of the current hospital budget knowledge of the entire trauma workload at multispecialty, is essential.

Methodology

Data collected using a database of all the categories of patients requiring admission, we undertook a retrospective cohort study of

consecutive patients admitted to a single-center between September 2017 and August 2018. The total data collected was 1237 out of that 217 were excluded due to incomplete data/missing data. Finally 1020 patient's data have taken for our study.

Irrespective of treatment what they ultimately ended up, all patients who were admitted under the direct care of the orthopedic team were included in our study. Patients who were consulted on for other specialties or those who were only reviewed in the emergency department but then subsequently discharged from the hospital were not included in this study.

Results

During the specified year, analysis of the patient presentations showed that there were 1020 patients admitted under the orthopedics department. The average age of these patients was 41. 14 years with a gender ratio of 61:39 Male to Female **FIGURE 1**.

Bimodal distribution of patient age was noticed. The higher rates admissions were for young adults up to the age of 35 years old, as well as for those above 45 years old **TABLE 1 and FIGURE 2**.

There were upper limb fractures (91), (330) lower limb fractures, (14) neck fractures, (3) cellulitis, (112) cervical PIVD, lumbar PIVD (173), cervical and lumbar (53), (104) implant removal, head injury (117), (19) chest and abdomen injury, spine (02) and with (02) admissions not specified due to coding **TABLE 2 and FIGURE 3**.

Relatively even the number of patients admitted each month throughout the year, with the average being 82 patients. Most of the patients were admitted was about (106 patients), surprisingly the month was June 2018 **TABLE 3 and FIGURE 4**.

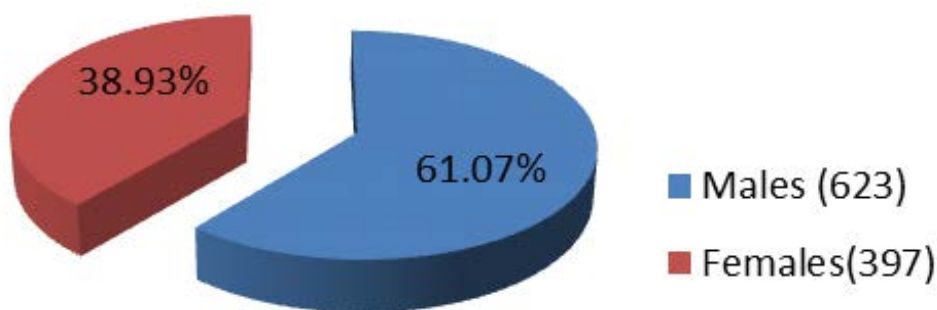


FIGURE 1. Gender distribution.

TABLE 1. Patients age who admitted with trauma.

Age (Years)	Males (n)%	Females (n)%	No of Patients
			N=1020 (%)
0 to 10	25 (2.45)	9 (0.88)	34 (3.33)
11 to 20	58 (5.68)	13 (1.27)	71 (6.96)
21 to 30	147 (14.41)	43 (4.21)	190 (18.62)
31 to 40	136 (13.33)	107 (10.49)	243 (23.82)
41 to 50	108 (10.58)	101 (9.90)	209 (20.49)
51 to 60	72 (7.05)	74 (7.25)	146 (14.31)
61 to 70	50 (4.90)	31 (3.03)	81 (7.94)
71 to 80	19 (1.86)	11 (1.07)	30 (2.94)
81 to 90	7 (0.68)	6 (0.58)	13 (1.27)
91 to 100	1 (0.09)	1 (0.09)	2 (0.19)

FIGURE 2. Age and Gender specific incidence in overall admissions.

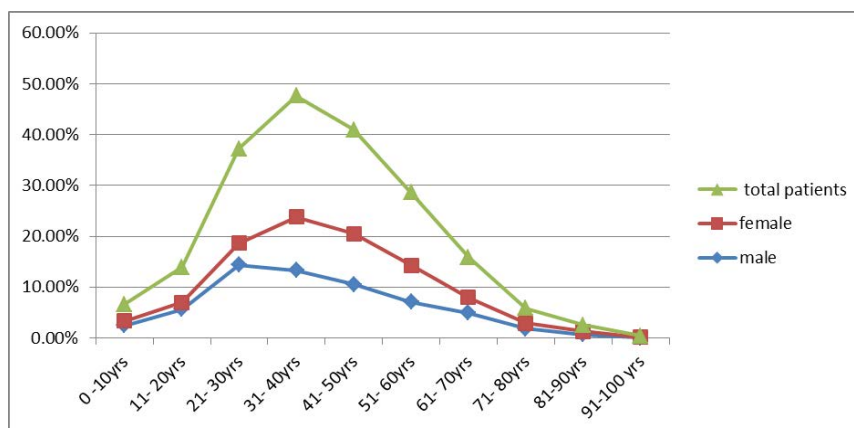


TABLE 2. Types of fractures.

Types of fracture	Number (n=1020) (%)
Upper limbs fractures	91 (8.92)
Lower limbs fracture	330 (32.35)
Cellulites	3 (0.29)
Cervical PIVD	112 (10.98)
Lumbar PIVD	173 (16.96)
Cervical and lumbar PIVD	53 (5.19)
Implant removal	104 (10.19)
Head injury	117 (11.47)
Chest and abdomen injury	19 (1.86)
Neck	14 (1.37)
Spine	2 (0.19)
Not specified	2 (0.19)

FIGURE 3. Case distribution in percentage on basis of diagnosis.

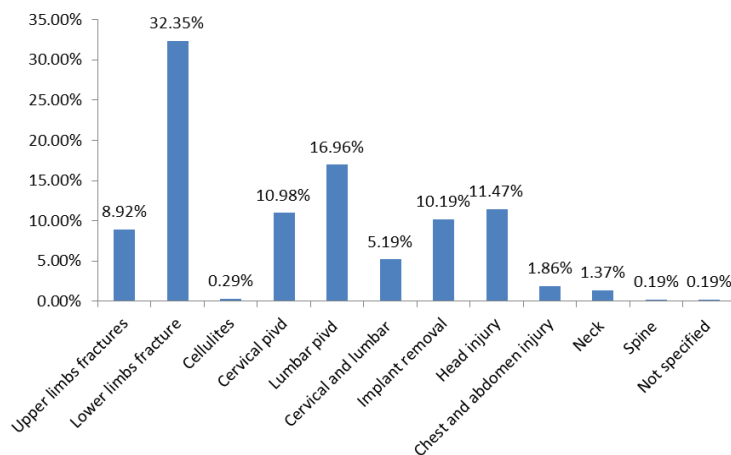
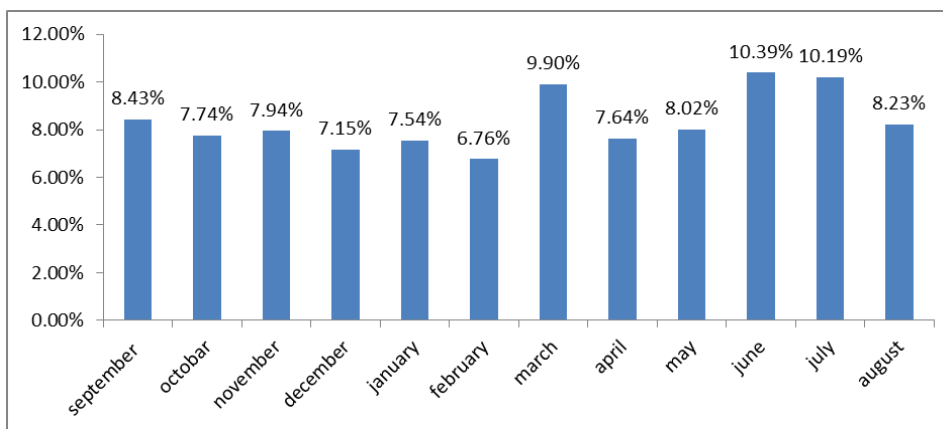


TABLE 3. Total number of patients admitted per month with trauma.

Months	Number (%) n=1020
Sep-10	86 (8.43%)
Oct-10	79 (7.74%)
Nov-10	81 (7.94%)
Dec-10	73 (7.15%)
Jan-10	77 (7.54%)
Feb-10	69 (6.76%)
Mar-10	78 (7.64%)
Apr-10	82 (8.023%)
May-10	101 (9.90%)
Jun-10	106 (10.39%)
Jul-10	104 (10.19%)
Aug-10	84 (8.23%)

**FIGURE 4. Incidence of admissions monthly wise.**

Discussion

The study found the average age of these patients was 41. 14 years with a gender ratio of 61:39 Male to Female. Due to gender biases persisting in male-dominated developing countries like India this may be happening. This may be because 67.9% of our admissions were “trauma cases” for which RTA was the major culprit and men drives mostly both the public and private vehicles in Warangal. Taylor et al. showed the average age of admissions to be 53. 12 years with a gender ratio of 51:49 Male to Female In a similar study conducted in England.

In our study, lower limb fractures dominated the trauma admissions than upper limb fractures. Results in order were shown by Taylor et al. in a similar study conducted in England where lower limb fractures predominated [15].

The present study revealed that the admission rates were the highest for young adults between the age of 21 and 50 years (n=642, 62.89%), similar to the findings [7,8,12] indicating that the majority of people involved in RTAs were in the productive age groups. Both the mean age and disproportionately higher admission

rates for younger adults could lead to loss of productivity and negatively impact the economy.

A reasonably steady number of admissions between 75 and 105 patients per month, throughout the year, noticed. Summer months noticed highest number of admissions. This may be due to more outdoor activities causing more people to injure. Pediatric admissions goes up with good weather, whereas adverse weather conditions cause children to stay indoors and thus the risk of injury is lower shown by few previous articles [18]. Within the adult population it has been found that those over the age of 65 and with hip fractures have a much higher incidence with worse prognosis if they are admitted when the weather is worse [19].

Conclusion

Our results showed there is a rising incidence of orthopedic fractures in adult males, which is not matching out the fractures previously reported in young and older people. Leading cause for orthopedic admissions was fractures, accounted more than 2/3 of the total admissions. Biasness in gender admission reflects true picture of a male-dominated society and the lower limb

fractures were dominating in our study.

The most common type of injuries was fractures, while the most common determinants of the injuries were falls, RTAs. Loss of productivity and negative impact on the economy is mainly by both the mean age and disproportionately higher admission rates for younger adults. Our results may help guide where efforts to improve healthcare delivery and public health policy should be focused.

Study Strengths

The methods and study designs we used are quick and relatively inexpensive. We found almost 75% of all cases very easily.

Study Weakness

We could not always be certain of data accuracy because we collected data retrospectively. RTA victims who die before reaching the hospital may have been missed in our study. Some patients were admitted under other departments, such as general surgery and orthopedic injuries, and intensive care unit were discharged from the hospital without being admitted to orthopedic wards and thus have possible chance of missing.

Our study has some limitations. Firstly, results may not be generalized to other settings because the study was performed in only a multi-specialty teaching hospital. Second, the time duration of this study is of only one year

and patient number is only 1020. Lastly, we have not presented the types or outcome of treatment received. It would be really interesting to compare our current findings over time as we continue to develop our trauma care.

Authors Contribution

- Data collection literature review and research work is done by Saikiran Velpula
- Data entry into excel sheets done by Laxmi Prasanna Gummadi
- Extraction of result done by Bharath Kumar Dasari
- The manuscript was written by Nagaraju Vallepu
- All the above work was guided by Shyam Sunder Anchuri

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Conflict of Interest

The authors declare no conflict of interest.

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REFERENCES

- Buhr AJ, Cooke AM. Fracture patterns. *Lancet*. 273, 531-536 (1959).
- Aitken SA, Hutchison JD, McQueen MM, Court-Brown CM. The importance of epidemiological fracture data injury epidemiology for the non-epidemiologist. *Bone Joint J*. 96, 863-867 (2014).
- Donaldson LJ, Cook A, Thomson RG. Incidence of fractures in a geographically defined population. *J Epidemiol Commun Health*. 44, 241-245 (1990).
- Van Staa TP, Dennison EM, Leufkens HG, Cooper C. Epidemiology of fractures in England and Wales. *Bone*. 29, 517-522 (2001).
- Hanche-Oslen TP, Alemu L, Viste A, Wisborg T, Hansen KS. Trauma care in Africa: a status report from Botswana, guided by The World Health Organization's 'Guidelines for Essential Trauma Care'. *World J Surg*. 36, 2371-2383 (2012).
- Gosselin RA, Spiegel DA, Coughlin R, Zirkle LG. Injuries: the neglected burden in developing countries. *Bull World Health Organ*. 87, 246 (2009).
- Gichuchi K. Injury pattern among non-fatal road traffic crash victims. *EAQJ*. 1, 23-25 (2007).
- Huda N, Gupta P, Pant A, Iqbal A, Julfiqar M, et al. Pattern of orthopedic injuries among patients attending the emergency department in a tertiary care hospital. An analytical study. *Acta Medica International*. 1, 10 (2014).
- Ahmed E, Chaka T. Orthopedic and major limb trauma at Tikur Anbessa University Hospital, Addis Ababa-Ethiopia. *East Cent. Afr J Surg*. 10, 43-50 (2005).
- Pan R, Chang N, Chu D, Hsu K, Hsu Y, et al. Epidemiology of orthopedic fractures and other injuries among inpatients admitted due to traffic accidents: a 10-year nationwide survey in Taiwan. *Sci World J*. 637872 (2014).
- Thomas V, Lavanya, Sridhler. Epidemiologic profile of road traffic accident (RTA) cases admitted in a tertiary care hospital-a retrospective study in Hyderabad, Andhra Pradesh. *IJMPS*. 3, 30-36 (2013).
- Manna N, Mallik S, Mandal P, Chakraborty D, Sardar JC, et al. Epidemiological factors of road traffic accidents: a study in a tertiary care setting in India. *JPMS*. 3, 48-53 (2013).
- World Health Organization (WHO). WHO global report on falls prevention in older age. Geneva (Switzerland) (2007).
- Alamgir H, Muazzam S, Nasrullah M. Unintentional falls mortality among elderly in the United States: time for action. *Injury*. 43, 2065-2071 (2012).
- Taylor A, Young A. Epidemiology of orthopedic trauma admissions over one year in a district general hospital in England. *Open Orthop J*. 9, 191-193 (2015).
- Wui LW, Shaun GE, Ramalingam G, Wai KM. Epidemiology of trauma in an acute care hospital in Singapore. *J Emerg Trauma Shock*. 7, 174-179 (2014).
- Paden M, McGee K, Krug E. Injury: A leading cause of the global burden of disease, Geneva, Switzerland: World Health Organization. 2000-2002.
- Collinge C, Lebus G, Gardner MJ, Gehrig L. Osteoporosis in orthopaedic trauma patients: a diagnosis and treatment protocol. *J Orthop Trauma*. 22, 541-547 (2008).
- Pego M. Analysis of traffic accidents in Gaborone, Botswana, 2009.