

Orthopedic trauma in hilly area of Kumaon region: A clinico epidemiological study

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ABSTRACT

Background: Inhabitants of hilly area of Kumaon region are susceptible for sustaining injuries due to multiple factors. Commuting by narrow road with several turnings and landslide; outdoor activity like farm works, forest activity are the source of the common trauma. Patients have to travel a long distance to get suitable treatment and lack of proper and quick transportation makes them more vulnerable.

Aim: To analyze the magnitude, epidemiological, clinical profile, pattern and outcome of musculoskeletal injury in hilly region of Kumaon.

Methods: A retrospective study, based on medical records of patients in hilly Kumaon region having musculo-skeletal injury during March 2005 to march 2012 was conducted. A total of 2931 patients (1709 male and 1222 female) case records were scrutinized. The data were entered in a preformed proforma which includes preliminary information and specific data like, mode of injury, time of presentation, level of injury, site of injury, associated injury, and treatment modality. These parameters were analyzed by EPI INFO 2002.

Results: Mean age of the patient was 29.7 ± 15.3 years. Road traffic accident (31.24%) was the commonest mode of injury followed by fall from height. 815 patients were treated conservatively, compared to 1400 patients who were treated surgically.

Conclusion: Persons in reproductive age group met orthopedic and spine injury the most and presented late. Most of causes of injury are preventable. Specific observations of this study may help in further planning for preventive measures and management in our setting.

Keywords: clinico-epidemiological study, orthopedic trauma, Kumaon, hills

INTRODUCTION

Trauma has been man's constant companion since the earliest time, however, despite its huge importance it is as common killer of human. It has been referred as neglected disease of modern society especially in underdeveloped areas like hills. Economy of Uttarakhand is predominantly dependent on mountain agriculture. Out of six districts, five districts are situated on hills and 78.98% of Kumaon population is staying there. Hilly regions are prone for road traffic accidents (RTA) and resultant musculo-skeletal injury. There are very few number of studies conducted in such areas. Medical infrastructures are not well developed. Roadway connectivity of inter-districts and their blocks are not good. All healthcare parameter and access to health care in the rural parts of mountain districts continues to be poor despite of Uttarakhand existence.

Government Medical College and associated hospital is situated at foot hill area Haldwani. This institution is largest institution of government of

Uttarakhand. Planes continue from here and overall facilities are also better in this area. Patients used to reach this area for getting medical facilities. Hence it was considered worthwhile to have a retrospective hospital-based analysis of injuries sustained by the inhabitants and tourists in order to know the actual burden and its consequences so that further planning in terms of preventive measures, as well as management protocol, can be improved accordingly.

MATERIALS AND METHODS

It is a retrospective, hospital-based study of patients presenting with musculoskeletal injury at emergency and department of Orthopedics of Government Medical College, Haldwani during Apr' 2005 to Apr' 2012. A total 2931 patients were admitted in the ward, out of which 716 were referred to concerned specialty of same hospital or other centre of excellence for further management. Every patient of trauma who presented at emergency and outdoor was evaluated with proper clinical examination and

investigations. All those minor injured patients who did not require any orthopedic intervention were excluded.

Data was collected by scrutinizing all medical record files from the medical record section. Detailed clinical history and examination, demographics, mechanism of injury, nature of injury, time lapse in reporting at emergency since injury, details of injuries according to relevant organ or system, management details (operative or non operative management) were recorded in a preformed pro forma. Data was entered in excel sheet and was analyzed with the help of EPI INFO 2002 for frequency, mean, tables and correlation. It gives an overview of clinico-epidemiological characteristics and burdens of musculoskeletal-injured orthopedic patients and the cause of delay to approach to appropriate medical centre.

This study will help formulate a basis to evaluate the treatment modalities offered to these patients and help to plan preventive aspects of such injuries at the community level.

RESULTS

The mean age of the patients was 29.7 ± 15.3 years. The male: female ratio was 1.3:1. Most of the trauma victims were farmers followed by laborers and tourist. The commonest causes of injury were road traffic accident (31.24%) followed by fall from height (27.84%). Descriptive analysis showed that maximum number of patients suffered long bone fracture (25.11%) followed by spinal injury (22.89%) and injury around major joint (20.64%). With respect to the other site of injury associated with musculoskeletal injury, the most common site was also spine (496 cases), followed by head injury (356 cases). There were 60 cases with poly trauma. Fall from height was the commonest mode of spinal injury, followed by road traffic accident. Fall from trees while cutting leaves, fall from unbarricaded first/ second floor verandah, fall while trying to repair roofs, slip from hill slope, slip while carrying weight on head were notable modes of injury reported.

Maximum numbers of patients (41.55%) come from Nainital district followed by Almora district (25.64). 815 patients were managed conservatively and 1400 underwent operative management for

Table 1: Different Cause of injury of patients

Type of injury		Male	Female	Total
Road traffic	Low energy	430	266	696(23.74%)
	High energy	192	28	220(7.50%)
Fall from height		428	388	816(27.84%)
Domestic injury		184	156	344(11.73%)
Physical assault		139	32	171(5.83%)
Outdoor activity		332	352	684(23.33%)
Total		1709(58.3%)	1222(41.69%)	2931

Only 212 patients got primary pre hospital management. The mean duration of presentation since the incident was 32.8 ± 9.2 hours. Majority of patients (38.04%) presented after a gap of more than 24 hours.

Table 2: Presentation duration of patients to our institute after injury

Number of hour from injury	Number of patients
0-6 hour	235(8.01%)
6-12 hour	462(15.76%)
12-24 hour	636(21.69%)
24-48 hour	1115(38.04%)
More than 48 hour	483(16.4%)
Total	2931

musculoskeletal injury. Death of musculoskeletal injured patients with or without any associated lesions was only five; these patients were associated with multiple co- morbidity and poly trauma.

DISCUSSION

The skeletal injuries are the one of most common injuries sustained by trauma patients. It occur in 78% of polytrauma patients.¹ In our study, trauma prevalence in male was 58.30%, where as in female it is (41.69%). RTA is most common (31.24%) cause of musculoskeletal trauma in our study, of which low energy RTA injury outnumber. Majority of these accidents (74%), are due to two wheeler vehicles by a variety of mechanisms like skidding on road, fall from height, collision on turnings, collision under drug effect, and accident due to poor visibility. Trauma due to fall from height was (27.84%).

Most of the patients (38.44%) presents to us after 24 hours of getting injured. This delay is attributed to non availability of vehicle, lack of connecting

road, deep forests and its wild animal and road blockade (specially in rainy seasons). Those patients (8.01%) who presented within 6 hours, could manage only due to 108 services.²

After analysis of orthopedic injury pattern we find that long bone fractures (25.11%) are commonest presentation followed by spinal injury (22.89%) and fracture around joint (20.64%). Fall from the height and RTA is major cause of long bone fracture and spinal injury. Upper limb long bone fractures are more common than lower limb. High energy RTA generally leads to poly trauma (2.04%), Pelvic fractures (2.42%) as well as fracture dislocation of major joint. Most common association with musculoskeletal injury is spinal injury (496 cases) followed by head injury (356 cases). Spine-injury prevalence in trauma patients is (22.89%). Out of all the spinal fractures, 90% occur between T-11 and L-4 vertebra.¹

The fall from height was the commonest cause of spinal injury followed by fall from trees in our study. This might be because of the geographic pattern of our region and the need to climb trees for fodder. Pickett *et al.* recommended that prevention programs should expand their focus to include home safety and avoidance of falls in the elderly.³ The musculoskeletal injuries are found to have a rising trend in our setting in physically active and productive age groups (21-40 years), which lead to decline in qualitative and quantitative aspects of life along with socioeconomic burden to the nation. Such injuries should be prevented with a very sound preventive program in the community.

Analysis of the trend of injury and its cause and associated risk factors influence the planning of

preventive and remedial measures pertaining to the human habitations, roadways and in the setup of health care institutions for any eventualities.⁴ A number of studies on various aspects of non-natural deaths reported road traffic accidents to be the major cause of mortality arising from non-natural causes in different regions of India.⁵

This study has shown that majority of the trauma cases are due to preventable causes. The need for trauma care systems (regional / local / national) should be the priority for any developing country based on their regional geography and health care systems. Establishing medical centers on the highways/roads/local or district levels, with training in basic ABC in trauma resuscitation for early intervention and referral will make the difference.

CONCLUSION

Accurate clinico-epidemiological data of incidence and pattern of orthopaedic trauma provides valuable information on magnitude of problem. It also projects the demand of health care in form of trauma care centers and other preventive measures. This study reflects the increasing burden of musculoskeletal trauma patients for treatment in this part of the country. There is an immediate need for modified comprehensive trauma management protocol in this geographical region.

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