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Pattern of Injury among Orthopaedic Inpatients in Teaching Hospital in Nepal

Suraj Bidary,[1] Suresh Pandey,[1] Hemant Kumar Gupta,[1] Roshani Aryal,[1] Kushal Bhattarai[2]

[1]Department of Orthopaedic Surgery, [2]Department of Biochemistry, College of Medical Sciences and Teaching Hospital, Bharatpur, Chitwan, Nepal

ABSTRACT

Introduction

Injury is a major cause of morbidity and mortality globally with the majority of them being orthopaedic in nature and are the resultants of fall, road traffic accidents (RTA), physical assault amongst others. The aim of this study was to determine the patterns of musculoskeletal injury among orthopaedic inpatients in a tertiary care teaching hospital in Nepal.

Methods

It was a cross-sectional study conducted in the department of orthopaedic surgery at College of Medical Sciences and Teaching Hospital (COMS-TH), Bharatpur from January to December 2019. Patients presenting with orthopaedic injury and admitted and treated as inpatients were assessed for their demographic details, mode of injury and other patterns of injury and descriptive analysis was done.

Results

In a total of 1027 patients, the mean age was 33.4 years (range: 1.0 - 95.0). Most of them (74.5%) were male. Right side was the most predominant side of injury (53.8%). Students were most commonly affected groups (34.8%). RTA was the most common mode of injury (66.9%). The commonest pattern of injury was fracture (70.1%). Closed bony injuries were sustained by 74.1%. Head injury was the most commonly associated injury.

Conclusions

The commonest mode of injury was RTA. Closed fracture was the most common type of fracture. Extremity injury was the most common site and head injury was the commonest associated injury. These patterns can serve as valuable tools in clinical decision making and further research studies.

Keywords: pattern of injury; road traffic accident.

Correspondance: Dr. Suraj Bidary, Department of Orthopaedic Surgery, College of Medical Sciences and Teaching Hospital, Bharatpur, Chitwan, Nepal, Email: bidary.suraj@gmail.com.

INTRODUCTION

Injury is a major cause of morbidity and mortality throughout the world.[1] The majority of the injuries are orthopaedic in nature.[2] Fall injury, road traffic accident (RTA), physical assault and other injuries cause more than fifty lakhs deaths every year, which account for nearly 9% of total deaths worldwide.[3] RTA is the leading cause of death globally computing for approximately 1.2 million deaths and more than 50 million injuries annually.[3] Moreover, in South East Asian countries, RTA is amongst the top five causes of death and disability.[4] According to world Health Organization, majority (>90%) of the world's injury related mortalities occur in low and middle-income countries.[3] Traumatic injury is an important cause of mortality and contributes to approximately 9% of total deaths annually in Nepal.[3, 4]

The burden of traumatic cases in society in terms of morbidity, mortality and economic loss is huge. Besides it, knowledge of injury pattern and demographics can help identify risk factors for injury and target interventions for prevention. It can also help to plan the proper treatment, training of human resources and optimum utilization of limited health facility in country like ours. There are limited data available related to pattern of injury from our country. We conducted this study to find out the patterns of injury among orthopaedic inpatients in a tertiary care teaching hospital in Nepal.

METHODS

It was a descriptive cross-sectional study (retrospective chart review) conducted in the department of orthopaedic surgery at College of Medical Sciences and Teaching Hospital (COMS-TH), Bharatpur from January to December 2019. Ethical clearance was obtained from the Institutional Review Committee of COMS-TH (COMSTH-IRC) **(Ref NO: 2020-058)**. Data collection was done by reviewing the case charts from medical record section of the hospital. Patients presenting with orthopaedic injury and admitted and treated as inpatients were included. Exclusion criteria were those patients with incomplete data, patients discharged from emergency ward after primary treatment, patients expired in emergency ward, and those who were managed by other department with interdepartmental consultation. A predesigned case proforma was used to collect the details of injury from the patients' case reports. The different variables considered for descriptive analysis were the demographic details of the patients (age, gender, occupation) and mode of injury and other injury details such as open or closed injury, type of injury and type of associated injuries.

Statistical analysis

Data obtained from the case chart were entered into excel master chart. After preliminary data management (data cleaning, omission of in complete data), statistical analysis was done using SPSS version 20.0. Frequency and percentage were used to describe the categorical variable and mean with range to describe the continuous variable.

RESULTS

The present study showed mean age of 33.4 years (range: 1.0 -95.0) among total of 1027 orthopaedic inpatients managed for period of one year. There were 74.5% (n=765) male and 25.5% (n=262) female patients.

The details of mode of injury have been presented in table 1. Road Traffic Accident was the most common mode of injury (66.9%, n=687) followed by slip on the floor and animal related injuries being least common.

Table 1. Distribution of patients according to mode of injury.

Mode of injury	Percentage (n)
RTA	66.9% (687)
Slip on the floor	9.3% (96)
Fall from height	9.0% (92)
Object related	5.9% (61)
Playground injury	3.6% (37)
Machinery	3.2% (33)
Physical assault	1.5% (15)
Animal related	0.6% (6)
Total	100% (1027)

Right side was the most predominant side of injury (53.8%, n=355) followed by left side (44.9 %, n=296). There was 1.3% (n=9) bilateral involvement among all extremity fractures. Students (34.8%, n= 357) were most commonly affected group.

Table 2. Distribution of traumatic cases according to sites and pattern of injury.

Type of injury	Percentage(n)
Upper limb fracture	32.4% (333)
Lower limb fracture	31.8% (327)
Pelvis fracture	4.8% (49)
Spine fracture	1.1% (11)
Dislocation	4.7% (48)
Fracture dislocation	1.9% (19)
Closed soft tissue injury alone	16.1% (165)
Cut injury	12.7% (130)
Laceration	25.5% (262)
Tendon and muscle injury	6.3% (65)
Nerve injury	3.1% (32)
Vessel injury	2.0% (21)
Ligament injury	4.5% (46)
Meniscus injury	2.6% (27)
Associated injuries	13.1% (135)

The study showed that the commonest pattern of injury was fracture (70.1%, n=720) out of all traumatic cases. Among all the fracture, upper limb fracture was the most common type (32.4%, n=333) followed by lower limb fracture (31.8%, n=327). Spinal injuries was the least common type (1.1%, n=11). (Table 2)

Among all upper limb fractures, fractures of wrist and hand were most common (35.7%, n=119) followed by fracture of forearm bones (18.0%, n=60) and fracture around elbow (17.4%, n=58). Proximal humerus fracture was the least common type (1.8%, n=6). Among all elbow injuries, supracondylar fracture was the most common (41.4%, n=24) followed by olecranon fracture and distal humerus fracture (15.5%, n=9 each). Capitellum fracture was the least common type (1.7%, n=1) of elbow injury.

Out of all lower limb fracture, fracture of tibia/fibula was the most common (28.4%, n=93) followed by ankle and foot (21.7%, n=71). Fracture around knee constituted 17.4% (n=57) of the total lower limb injury. Fracture of proximal femur was the least common type (10.1%, n=33). Among tibia/fibula fracture, there was 63.4% (n=59) closed fracture and 36.6% (n=34) open fracture.

Regarding dislocation which constituted 4.7% (n=48) of the overall patients (table 2), acromioclavicular joint dislocation was the most common (29.2%, n=14) followed by elbow dislocation (14.6%, n=7). Shoulder dislocation was the third most common type (10.4%, n=5) and knee dislocation was the least common type (2.7%, n=1).

On analysis of tendon injury which constituted 5.9% (n= 61) of the total traumatic cases (table 2), upper limb extensor tendon injury was the most common (32.8%, n=20) followed by lower limb extensor tendon injury (26.2%, n=16). Lower limb flexor tendon injury was the least common type (16.4%, n=10).

Among the total cases of ligament injury (4.5%, n=46, table 2), anterior cruciate ligament was the most commonly injured ligament (52.2 %, n=24) followed by multi ligamentous injury (41.3%, n=19). Posterior cruciate ligament injury was the least common type (6.5%, n=3).

Out of all bony injuries of the extremities including pelvis and spinal injuries (n=787), there were 74.1% (n=583) closed injuries, 24.1% (n=190) open injuries and 1.8% (n=14) both closed and open injuries.

Associated other organ system injuries were present in 13.1% (n=135) of all traumatic cases (tables 2 and 3). Among them, head injury was the most common (66.4%) and abdominal injury was least common (4.4%), as shown in table 3.

Table 3. Different types of associated injuries in the study participants.

Associated injuries	Percentage (n)
Head	64.4% (n=87)
Combined visceral injuries	13.3% (n=18)
Thoracic injuries	11.1% (n=15)
Pelvic injuries	6.7% (n=9)
Abdominal injuries	4.4% (n=6)
Total	100% (n=135)

DISCUSSION

Injury is a major cause of morbidity and mortality not only in developed countries but also in developing countries[5]. It also involves huge economic loss because most of the patients are from productive age group[6]. The current study was designed to assess the pattern of musculoskeletal injury among orthopaedic inpatients.

Regarding socio-demographic characteristics of the patients, it was found that the mean age of patients was 33.4 years, comparable to the findings of Uthkarsh et al[7] (35.5 years), Blankson et al[8] (27.9 years), Jha et al[9] (31.5 years) and Abhilash et al[6] (40.2 years). The male predominance in the current study (74.5%) is similar to the findings shown by Pant et al[3] , Huda et al[10], Ghani et al[2], and Shiva Prakash et al[5] with incidence of 68.4%, 71.1%, 67.9%, and 73.3%, respectively. Among all the patients, students (34.8%) were the most commonly affected groups which is similar to the study conducted by Hsia et al[11] (20%).

Road Traffic Accident was the most common mode of injury, a finding consistent with study conducted by Huda et al[10], Ghani et al[2], Shiva Prakash et al[5] and Uthkarsh et al[7]. However, there was slightly increased prevalence of RTA in the current study (66.9%) as compared to above studies. In contrast, however, Pant et al.[3] found fall injury as the most common mode of injury (40.1%) followed by RTA (34.6%) .The injury pattern showed right sided dominance (53.8%), similar to the study conducted by Mishra et al[4].

Fracture was the most common pattern of injury (70.1%) which is consistent with the study performed by Huda et al[10] (68.6%), Ghani et al[2] (67.8%), Shiva Prakash et al[5] (67.0%) and Pant et al[3] (33.7%) . Among all the fractures, upper limb fracture was the most common site (32.4%) followed by lower limb (31.8%). This finding is consistent with the study conducted by Mishra et al[4] where upper limb fracture was present in 41.0% and lower limb fracture was present in 40.5% of the cases. In contrast, Huda et al[10], Shiva Prakash et al[5], Ghani et al[2] and Manwana et al[12] found lower limb as the most frequent site of fracture. Among all the upper limb fractures, wrist and hand were the most common sites involved (35.7%) which is consistent with the study done by Banskota et al[13] (38.8%). Similarly, among all the lower limb fracture, tibia/fibula fracture was most common (28.4%) which is consistent with the study done by Huda et al[10], Shiva Prakash et al[5], Ghani et al[2] and Badoni et al[14].

In the current study, there were 4.7% cases of dislocations at different joints. Acromioclavicular joint dislocation was the most common type followed by elbow dislocation and shoulder dislocation. In the study by Verma et al[15], there were 1.9% cases of various dislocations out of all traumatic cases with hip dislocation being most common type. In contrast, Shiva Prakash et al[5], Huda et al[10] and Ghani et al[2] observed 3.8%, 3.9% and 3.9% cases of dislocations, respectively with shoulder dislocation being the most common type.

There were 5.9% cases of various tendon injuries with upper limb extensor tendon injury being the most common type (32.8%). In a study by Ghani et al[2] and Manwana et al[12], there were 7.6% and 5.9% of tendon injuries among all traumatic cases, respectively.There were 4.5% cases of ligamentous injuries with anterior cruciate ligament injury being the most common type (52.2%) followed by multi ligamentous injury (41.3%). Data regarding isolated ligamentous injury could not be found in the English literature. In a study by Shiva Prakash et al[5], Ghani et al[2] and Huda et al[10], there were 8.4%, 11.8% and 13.8% cases of ligamentous and muscle injuries among all traumatic cases, respectively. Out of all bony injuries, there were 74.1% cases of closed injuries, 24.1% cases of open injuries and 1.8% cases of both closed and open injuries. In a study by Pant et al[3], Huda et al[10], Ghani et al[2] and Shiva Prakash et al[5]; there were 94.5%, 71.7%, 71.3% and 72.7% cases of closed fractures, respectively and 5.5%, 28.3%, 28.7% and 27.3% cases of open fractures, respectively.

Associated injuries were present in 13.1% of all traumatic cases. Among them, head injury was the most common (64.4%) and abdominal injury was the least common (4.4%). In the study by Pant et al[3], associated injuries were present in 28.1% of trauma cases with head injury being most common (44.0%) and abdominal injury being the least common (6.1%). In the study by Huda et al[10], associated injuries were present in 24.1% of traumatic cases with head injury being most common (71.5%) and genitourinary injury being least common (4.5%). In the study by Ghani et al[2] and Shiva Prakash et al[5], associated injuries were present in 24.1% and 24.3% of cases, respectively. Most commonly associated injuries were head injuries (63.5% and 75.4%, respectively) and least common injuries were pelvis and genitourinary injuries (5.0% and 4.0%, respectively) in their study.

The principal limitation of the present study is related to its study design. A retrospective chart review of the hospital based patients, the study clearly lacks generalizability. Likewise, the strength of this study is the sample size representing the total duration of one year, thus depicting a clear picture of seasonal variation.

CONCLUSIONS

Road traffic accident was the most common mode of injury out of all traumatic cases. Among them, extremity fractures were the commonest patterns of injury with fracture of wrist/ hand and tibia/fibula again being the most common among them. Acromioclavicular joint dislocation was the most common type of dislocation. Similarly, majority of bony injuries were of closed type and head injury was the most commonly associated injuries. These findings might help pave a pathway for further studies and could be valuable in clinical decision making.

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Conf ict of interest

There was no competing interest from any party.

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