

# Trend of Orthopedic Trauma Patients and Seasonal Variation

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## ABSTRACT

**Introduction:** This study is done to identify the seasonal trend of orthopedic trauma cases and to determine various epidemiological factors involved in causing orthopedic trauma cases.

**Material and methods:** A descriptive study is performed in the Department of Orthopedics at a tertiary referral centre of Nepal. 5280 were total trauma cases during our study period. Study variables: Demographic characteristics of the cases, season, the month of injury and cause of trauma.

**Results:** In our study period from 2012-2018, there were total 5280 admissions. Out of which Male were 3820 and female were 1460 showing male predominance. Road traffic accident (RTA) was the commonest cause of injury (61.28%). Common age group affected was of age 0-10 years (21.55%) and urban population (67.65%). Maximum cases of trauma occurred during summer (44.89%). Fracture of lower extremity was commonest (54.75%). Upper limb trauma in summer was maximum (1218cases) followed by lower limb trauma during rainy season (1213 cases). Summer season constitutes the majority of cases (44.89%) with month of April taking a lead (17.75%).

**Conclusion:** There is a seasonal variation of orthopedic trauma cases with predominance during summer season.

**Keywords:** Trauma, Season, Orthopedic, Month.

## INTRODUCTION

Road traffic accidents are the second leading cause of trauma worldwide. [1] Trauma seems to follow similar epidemiological pattern. Epidemiological triad comes into play i.e. host, environment

and factor for the causation of traumatic event. Orthopedic surgeons usually hypothesize that environment variables may affect orthopedic injury or number of trauma cases, but only certain studies have formulated it. [2] Several literature show adult trauma to be correlated with temperature [3] and rainfall can increase cases in the rainy season due to road traffic accidents and slip on water. [4] Injury as a research problem has not been studied in developing countries. [5-7] In developing countries due to low economy and poor facilities there is increased financial burden morbidity and mortality due to trauma. So effort to prevent the trauma cases depends on qualitative information on the incidence, timing and injury pattern. Developing countries are lacking behind in proper records of trauma cases and research work due to the ignorance of data collection and research activity resulting in loss, which can be prevented. Due to lack of coordination between various ministries, departments and road developing agencies, working in the field of injury including road traffic injury, there is increase in road traffic accident case. This study is done to identify the seasonal trend of orthopedic trauma cases and to determine various epidemiological factors involved in causing orthopedic trauma cases.

## MATERIALS AND METHODS

The study was done in Department of orthopedics, at a tertiary referral center from Nepal. Data were collected from our institutional record of the period 2012–

2018. Inclusion criteria were injured patients of any age presenting to the orthopedic department. Demographic parameters, season and month were taken into consideration. The collected data was entered into Microsoft Excel and analyzed.

## RESULTS

In the data which was collected from 2012-2018, a total of 5280 patients were presented to orthopedic department in the tertiary referral centre in Nepal. The commonest cause of trauma was found to be road traffic accidents, accounting around 61.29% (Table 1).

**Table 1: Distribution according to cause of trauma**

Cause of trauma	Number of patients	Percentage %
Road Traffic Accidents	3236	61.29
Fall from height	986	18.67
Minor slip	1058	20.04
Total	5280	100

Age group 0-10 years was found to be most trauma affected age group (21.55%)(Table 2).

**Table 2: Distribution according to age group**

Age group in years	Number of patients	Percentage %
0-10	1138	21.55
11-20	832	15.76
21-30	986	18.67
31-40	628	11.89
41-50	512	9.71
51-60	356	6.74
>60	828	15.68
Total	5280	100

Regarding sex distribution maximum affected were male (72.35%), far more than female (Table 3).

**Table 3: Distribution according to sex**

Sex	Number of patients	Percentage %
Male	3820	72.35
Female	1460	27.65
Total	5280	100

People from urban area were affected more (67.65%) from trauma than from rural area (Table 4).

**Table 4: Distribution according to geographical area**

Geographical area	Number of patients	Percentage %
Urban	3572	67.65
Rural	1708	32.35
Total	5280	100

Maximum number of case were reported in summer (44.89%) followed by rainy season (Table 5). More cases were seen in the month of April (17.75%) followed by September (14.32%) (Table 5).

**Table 5: Distribution according to season and month**

Season	Month	Number of patients	Percentage %	Total %
Summer	March	324	6.13	44.89
	April	937	17.75	
	May	746	14.13	
	June	363	6.88	
Rainy	July	248	4.70	36.37
	August	577	10.93	
	September	756	14.32	
	October	339	6.42	
Winter	November	225	4.26	18.74
	December	286	5.42	
	January	322	6.09	
	February	157	2.97	
	Total	5280	100	100

Cases of trauma to upper extremities were more during summer and trauma to lower limb was found maximum during rainy season. Maximum number of cases was reported during summer season (44.89%). Overall lower extremities trauma accounts maximum cases (54.75%)(Table 6).

**Table 6: Distribution according to skeletal region involved**

Region of skeletal	Summer	Rainy	Winter	Total
Spine	73	62	24	159
Upper Extremity	1218	645	367	2230
Lower Extremity	1079	1213	599	2891
Total	2370	1920	990	5280

## DISCUSSION

Trauma has increased the economical loss and morbidity to the patients. It has become a major public health problem which could be prevented. World Health Organization predicts that trauma will be the third leading cause in 2020 worldwide. [8] In our study, male predominance is seen than female suggesting male with more exposure to outside for earning of livelihood and running family and female mainly confined to household activities in developing countries which is also indicated by various other author research work. [9-14] In our study majority of cases were of age group 0-10 years which needs to be prevented which can be done by educating children's parents for prevention of accidents. Most of the

injuries were seen in 0–30 year age group (55.98%) followed by older population >60 yrs contributing 15.68% of total admission, which indicates lack of elderly care in developing countries and frequent fall, similar findings were observed in other studies. [10,11,15-17] Road traffic accidents accounts for majority of trauma related cases (61.29%), reason behind this is lack of traffic rules and education, lack of good roads, ditches in roads. [18] In another study maximum cases were due to road traffic accidents in two wheelers. [12] In our study maximum cases were seen during summer (44.89%) followed by rainy season (36.37%), similar to others study. [19-21] Urban population is major group affected by trauma (67.65%). The increased cases of trauma in urban area is due to improper humps placement in roads, bad road conditions ,increased number of vehicles and lack of traffic rules and regulations. Various studies showed maximum cases during winter followed by summer due to different geographical areas. [9]

## CONCLUSION

To conclude, there is variation of trauma cases with seasonal change. Maximum case reported was during summer season. However, evaluation of a larger population from various part of world is needed to confirm these relationships.

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