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Original Article

Farm related and Wild Animals inflicted injuries related to Orthopaedics: Epidemiology and prospects for control

Suraj Bajracharya*

Department of Orthopaedics, Kist Medical College Teaching Hospital, Kathmandu

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Abstract

Background

Farm related and wild animals inflicted injuries in Orthopaedics is one of the major concern in developing countries like ours. As we don't know much about such injuries, it would be landmark study for our country. Therefore, the study helps us know better about its epidemiological aspects.

Materials & Methods

This prospective case series of farm related and wild animals inflicted injuries related to Orthopaedics, conducted from May 2006 to April 2008 at Department of Orthopaedics of B P Koirala Institute of Health Sciences, consisting of 87 patients admitted to the Orthopaedic ward, is presented. The preformed structured proforma were used to record the data and, later those records were analyzed.

Results

78 domestic related injuries and 9 wild animal related injuries were recorded in the recruitment period of two year. 23 femoral fractures, 14 humeral fractures, 11 Cervical spine injuries, 10 leg bone fractures, 9 forearm fractures were found. Fall from buffalo, Hit by buffalo were common cause of injuries in domestic related injuries whereas Hit / kick by elephant, attack by bear were causes of wild animal related injuries.

Conclusion

This study concluded that all adolescents and adults, of all age group and sex, should be included in community education and intervention programmes for prevention of such injuries. The prevention of this type was necessary.

Key words:

Farm, Domestic, Wild, Animals, Public Health

Introduction

It has been studied that injury rates for farming and non-farming sources were 1,683 and 6,980 per 100,000 persons, respectively. Animals (40%) were the primary sources of the farming operation related injuries; sports/recreation sources (61%) were associated primarily with non-farming related injuries. 83% of farming and 90%, of non-farming related injury required some type of treatment for them injures; in

detail, 17% and 24%, respectively, were constrained from regular day to day works for one month or more [1].

Cases of Orthopedic related injuries inflicted by farm related and wild animals were encountered in Emergency room and Outdoor Patients Room of a tertiary care center of Eastern Nepal. This study was focused on collecting data regarding the type of domestic and wild animals inflicted injuries. The socio-demography of the affected

patients, the type of injuries and its severity were noted. The purpose of this effort was to identify the incidence and consequences of animal inflicted orthopaedic related injuries and their potential risk factors. This study helps to assess the gravity of the problem and this area calls for preventive action.

Materials and Methods

This study was conducted in the Department of Orthopaedics, B. P. Koirala Institute of Health Sciences, Nepal, a tertiary care hospital, from 1st May 2006 to 30th April 2008.

All the patients attending Emergency Room and Out Door Patient Room with farm related and wild animal inflicted orthopaedic related injuries were included in the study. Following points were noted:

1. Socio-demography of the patient: Age, Sex, Occupation, Address, Cause of Injury
2. Type of injury
3. Anatomical structures inflicted
4. Neurovascular structures severance
5. Surgical interventions done
6. Follow up of 3 wks, 6 wks and 3 months
7. Total expenses for the treatment (Direct cost)

Above mentioned data were collected in the pre formed proforma, and entered into EXCEL 8. The entered data is analyzed with the help of EPI INFO.

Results

The study consists of 26 females and 61 males with mean age of 44.269 ± 23.425 yrs and 38.06 ± 20.88 yrs (P-value = 0.2248). Mean duration of reporting time to hospital is 67.72 hrs with SD of 106.47. Commonly farmers, housewives and students were involved in such type of injuries and details as shown in Table 1.

Table 1 showing different occupations of study population

Occupation	Frequency	Percent
Farmer	36	41.4%
Housewife	21	24.1%

Laborer	7	8.0%
Serviceman	1	1.1%
Shopkeeper	2	2.3%
Student	20	23.0%
Total	87	100.0%

In the study, 78 patients were found to be injured due to domestic animal related injuries where as 9 were due to wild animal related injuries. 7 patients were brought death in Emergency due to attack by wild elephants from various districts of Eastern Nepal. Mode of injuries by animals with frequency in details is shown in Table 2. Most of the patients reporting to our hospital were from Terai districts followed by hilly districts of Eastern Nepal as showed in Table 3.

Table 2 showing Mode of injury by domestic and wild animals

Mode	Frequency	Percent
Bear Bite	4	4.6%
Dragged by the rope of Bull	2	2.3%
Fall from Buffalo	17	19.5%
Fall from bullock cart hit by Bull	5	5.7%
Hit and thrown by Elephant	5	6.6%
Hit by buffalo	16	18.4%
Hit by Bull	12	12.3%
Hit by cow	11	12.6%
Hit by goat	2	2.3%
Hit by Horse	1	1.1%
Hit by Ox	12	12.5%
Total	87	100.0%

Table 3 showing no. of patients from different districts (region wise)

Districts	Region	Frequency	Percent
Siraha	Terai	19	22%
Sunsari	Terai	15	17%
Saptari	Terai	13	15%
Morang	Terai	11	12%
Jhapa	Terai	11	12%
Dhanusha	Terai	7	8%
Dhankuta	Hilly	3	3.5%
Udayapur	Hilly	3	3.5%
Bhojpur	Hilly	2	2.3%
Ilam	Hilly	1	1.25%
Terathum	Hilly	1	1.25%
Mahottari	Terai	1	1.25%

Table 4 shows the different part of the limbs injured due to domestic and wild animal inflicted injuries. Among them, 23 femoral fractures, 14 humeral fractures, 11 Cervical spine injuries, 10 leg bone fractures, 9 forearm fractures were found. Unfortunately, all the cervical spine patients had traumatic quadriplegia. 23 patients had open fractures whereas 50 patients had closed fractures. Among open fractured patients, 5 had neurovascular deficit and 10 had tendon injuries.

Table 4 showing anatomical regions injured

Anatomical regions involved	Frequency	Percent
Arm and shoulder	19	21.83%
Forearm and hand	12	13.79%
Thigh and hip	29	33.33%
Knee / Leg and Foot	13	14.94%
Spine	14	16.09%

36 patients were treated conservatively whereas rest of the patients was treated with operative measures. Closed reduction and immobilization was done with Plaster of paris casts/slabs in the patients managed with conservative treatment. Different internal and external fixation devices (Plates and screws, Nails, External fixators, pins) were used to stabilize femoral fractures, Leg bone fractures, humeral fractures, forearm bone fractures. Direct cost incurred due to the injuries (Hospital stay+ Drugs + Operative charges and Implants/ Plaster of paris) was NRs. 8524.4253 ± 4700.8836 with minimum of NRs 2000 to NRs 19500.

Discussion

It is alarming that traumatic injuries are increasing globally, moreover increasing trend in most developing countries, including Nepal. A large proportion of the injuries are caused by road traffic accidents, falls, burns, assaults, bites, stings and other animal-related injuries, poisonings, drownings/near-drownings and suicide. Globally, injuries are responsible for about five per cent of the

total mortality, and the overall global annual costs were estimated huge amount of money. The burden and pattern of injuries in Africa and other developing areas are poorly known and not well studied. The increase in incidence is, partly due to rapid growth of vehicular transport, urbanization and expansion of industrial production without adequate safety precautions.² As we have also lacking such information in our country, this study will be initiation to know the status of such injuries in our country. A computerized search of the relevant literature regarding injuries related to agriculture was done and a manual search of journals publishing texts on health in low-income countries and in tropical environments was also done. A few studies on injury prevention policy and on research related to injury epidemiology and prevention have also been identified and included.

Although a few surveys and other investigations of injuries have been conducted over the years, injury epidemiology and control remain under-researched and relatively neglected subject areas. Much needs to be done. Collection and analysis of injury data need to be standardized, for example regarding age groups, gender disaggregation and severity. Injuries and accidents should be subdivided in at least road traffic injury, fall, burn, assault, poisoning, drowning, suicide, homicide and others, and details regarding time and place, victim and main cause should be noted. Morbidity survey field staff should be informed that injuries are part of the illness concept and that questions should be asked accordingly. Details regarding the circumstances surrounding different injuries must be known to those who develop preventive programs.

Injury is a public health problem affecting some people more than others. Our ordinary environment--the home, the work-site, the street or road--represents various kinds of risk, and some of these are difficult to

eliminate. Occupational injuries can largely be prevented by well adapted environment and education in such places. Research is recommended in different areas. The outcome of emergency medical care and of different forms of transport and referral needs to be determined. This study helps us to know preventive interventions and its evaluation. Therefore it is intended to guide to highlight the need of a broader overview of the subject of such type of injury occurrence and prevention in Nepal, for example in preparation for the development of injury control programs or to help identify issues requiring further research in this field. The study similar to our study was conducted to find out the incidence of and potential risk factors for farm-related injuries in Eastern Ontario. One hundred and seventeen dairy and beef farms were surveyed using a personal interview, comparing our study comprising total of 87 different injuries. Information was collected on demographic characteristics of the farm owners, workers, and families; characteristics of the farm operations; and information on behaviors potentially affecting injury risk, where as in our study we studied occupation, mode of injuries, geographical area and site of injuries. Ontario study showed that the overall farm injury rate was 7.0 persons injured per 100 person-years (95% C.I.: 4.9,9.1, n = 547). Common patterns of injury by ICD-9-E-Code included accidents caused by farm machinery (E919.0), accidental falls (E880-8), and injuries caused by animals (E906). Variables found in multivariate logistic models to be predictive of injury occurrence were living on a beef farm (RR = 2.5; p = 0.01); increased farm work experience (trend: p less than 0.01); full-time exposure to farm work (RR = 2.5; p = 0.04); and, in farm owners, the use of prescriptions medications (RR = 2.7; p = 0.07). Forty-six percent of the farm-related injuries were treated in a hospital-based emergency department (ER). Efforts to

monitor the incidence of farm injuries using an ER-based information system have the potential to significantly under-estimate the scope of the regional farm injury problem in Eastern Ontario. [3] The study was significantly helpful to make our study more comprehensive as we needed prospective of this kind to find out RR and incidence in future studies on the basis of this study.

Studies from other developed countries have shown that agriculture is among the most dangerous occupational sectors in terms of work-related deaths. Pickett W et al. described the occurrence of fatal work-related farm injuries in Canada and compare these rates with those in other Canadian industries. The authors presented a descriptive, epidemiological analysis of data from the recently established Canadian Agricultural Injury Surveillance Program. Crude, age-standardized, age-specific and provincial rates of such injuries were presented, as are overall death rates in other Canadian industries. Other factors examined were the people involved, the mechanism of injury, and the place and time of injury. There were 503 deaths from work-related farm injuries during the study period, for an overall annual rate of 11.6 deaths per 100,000 farm population. High rates were observed among men of all ages and among elderly people [5]. In our study it was shown to be farmers and student involved in such injuries. Compared with other industries, agriculture appears to be the fourth most dangerous in Canada in terms of fatal injury, behind mining, logging and forestry, and construction. In our study it was found that farm related injuries were basically high in the rural part of eastern Nepal mostly in Terai belt than hilly area. It might be because of trandional farming in such area, poverty and lack of modern agricultural education.

Compare of others studies [2-5], injuries were of various grades, incapacitating patients to work in same job. This study also found out minimal to maximal direct

expenditure due to such injuries and recommended to perform cost analysis in such injuries.

The study has its weakness due to low sample size and further detail analysis of injuries correlated to other aspects. However, the study was preliminary report of retrospective study of such injuries in our country, for those who are interested to know that such injuries can be of public interest and further research can be done in different aspects.

Conclusion

From the present study and different studies searched from literature shows that farm related and wild animals related injuries are one of the major factors of injury burden to most of the agriculture based developing countries. Therefore, these types of injuries warrant immediate action for control by different preventive measures mainly primary prevention by educating adolescents and adults groups associated with farming occupations.

Animal related injuries are a major but neglected emerging public health problem and contribute significantly to high morbidity and mortality worldwide. No prospective studies have been done on animal related injuries in our setting. This study was conducted to determine the management patterns and outcome of animal related injuries and their social impact on public health policy in the region.

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