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In depth analysis of patients attending in a tertiary care hospital due to animal injuries: A major public health problem

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ABSTRACT

Background: Injuries and illnesses from animal encounters continue to be a major public health problem. Many injuries remain undocumented and increases mortality before receiving adequate medical care especially in tertiary care setup. Key of management is to increase awareness and knowledge regarding human-animal relationship, preventionand primary treatment of such injuries. **Aims and Objectives:** -1) To evaluate vulnerable age and sex affected by animal injury. 2) To evaluate which body parts are most injured by which type of animal. 3)To evaluate type of surgical intervention required. **Materials and Methods:** All patients admitted or treated due to animal injuries in the Department of General Surgery, B.S. Medical College and Hospital, Bankura, West Bengal during July,2011 to December, 2012. Unwilling patients, patient with aquatic animal injury and who expired on spot or before admission were excluded from study. **Results:** Total of 59 patients were included in this study, with 69% of them are male, mean age of presentation was 31years and the commonest age group being 3rd decade. Most of the incidence occurs in villages i.e. 90% and mainly injured by dogs 37% followed by cows 29%. **Conclusion:** Domestic animals like bull, cow and dog can cause various types of injuries. Management require individualized approach and often it is challenging for the surgeon. Early treatment is required to prevent further morbidity and mortality especially in visceral and thoracic injuries. Therefore, it is useful to raise awareness for preventing this type of injury so as to cause less public health burden.

Key words: Animal injuries, Public health, Management, Bankura, India

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INTRODUCTION

Human injury resulting from encounters with animals is increasingly common throughout the world, particularly as ecosystems change and humans encroach on previously wild land.

Injuries and illnesses from animal encounters continue to be a major public health problem. Animals can cause injuries by various mechanisms that include bite, sting, crush, gore, stomp, buck off, fall on, or scratch. Fortunately, the majority of such injuries are minor. However, many injuries remain undocumented and many people die, primarily in third-world countries, before receiving adequate medical care.The effects of animal injury on the victims are many, and include trauma, wound infection, potential exposure to rabies, and psychological problems.

The current study was designed to evaluate different patient suffering from animal injury with special reference to age sex distribution, type of animal, operative maneuver required and its outcome.

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MATERIALS AND METHODS

This was a retrospective study conducted in Department of General Surgery, Bankura Sammilani Medical College & Hospital, Bankura, West Bengal, India. The study period was from Jully-2011 to December-2012 and sample size of the study is 59.

Ethical committee clearance was taken for this study.

Inclusion criteria

People admitted within same duration with animal injury and were treated.

Exclusion criteria

Unwilling patients, patient with aquatic animal injury and who expired on spot or before admission were excluded from study.

After taking through history and performing clinical examination patient underwent relevant investigation likeUSG, X-ray, CT scan according to clinical parameters and were managed accordingly. Lacerated injuries around perineum caused by animals were repaired secondarily after surgical dressing. Dog bite injuries over face in children below 10 year were primarily repaired and outcome noted.

RESULT

Out of 59 patient studied 69% patient were male and 31% patient were female (Figure 1). In our study age distribution of the population is shown in Figure 2. Fourteen patients (24%) were between 1-10 years of age, 25 patients (42%) were between 30-50 years,11-30 years age and >50 years age consisted of 10 patients (17%) each.

Most of the patients 53 patients (90%) got injured in village whereas 6 patients (10%) in forest (Figure 3). Figure 4 shows different types of animal causing injuries. Thirty seven percent patients were injured by dogs, 29% patients were injured by cow,10% by bull attack. Elephants were responsible for 19% of patientsinjured, whereas monkeys in 3% and bear in 2% of patients.

Most of the animal injuries caused by sudden unprovoked attack of animal and counted as 42 (71%) in our study (Figure 5). Rest of the 17(29%) cases listed under provoked attack

In animal injuries due to cow and bull only 1 (4%) patient was injured by direct trauma with the head region of a bull over abdomen and rest 22 (96%) patient was injured by horn. 22% cases had injury in head, neck and face area, 09% cases had chest injury, 61% cases had injury over abdomen including perianal and inguinal region,whereas upper and lower extremity contains 4% each of the injuries. Horn injury usually produces lacerated injury requiring active operative intervention (Figure 6). One patient presented with direct trauma by head of cow over abdomen and one patient had injury both in abdomen and L.L.

Out of 22 patients injured by dog, only 2 patients presented only with scratch abrasion mark over abdomen, rest 20 patient had bite injury. Ten (50%) patient had bite injury over head, neck and face area, 5 patients (25%) had over lower limb,4 patients (20%) in upper limb and 1 patient (5%) had bite over around perianal region. There was no injury over chest region. Two patients presented with abrasion following scratch in abdomen (Figure 7).

Out of different types of injury wound caused by animals, most ofthem are scratches and superficial abrasions i.e., 25 (42%). Deep lacerated wound without tissue loss seen in 4 cases (7%) and with tissue loss seen in 17 cases (29%). Wound with flap avulsion presented in 7 cases (12%). Rest of the 6(10%) cases are puncture wound. (Figure 8)

Among 59 patients studied, 17 patients (29%) required active operative intervention.5 patients had undergone exploratory laparotomy. Out of these 3 patients injured by elephant and 1 patient by cow horn, 1 patient with bull. Among these 3 patients had undergone

Sex	N (%)
Male	41 (69)
Female	18 (31)

Figure 1: Sex distribution of the subjects under study

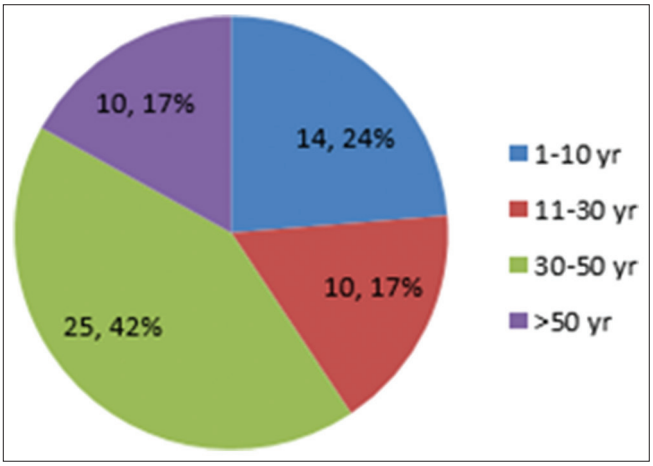

Figure 2: Age distribution

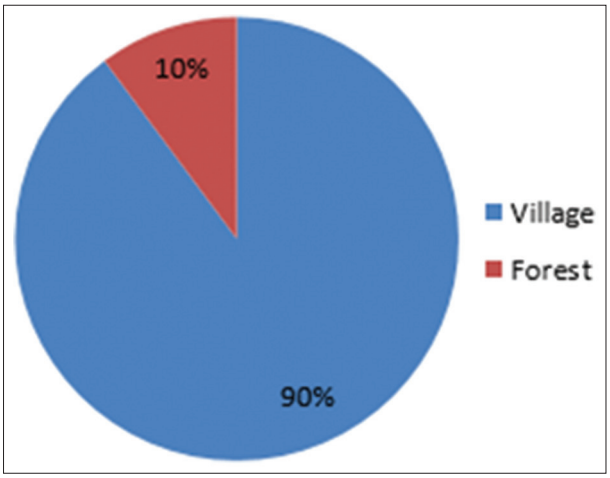

Figure 3: Place of incidence

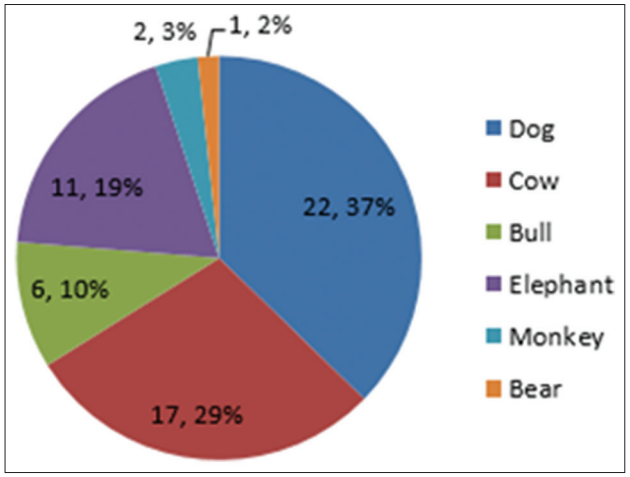

Figure 4: Type of animal

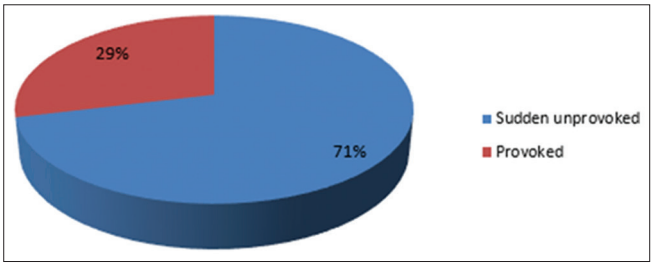

Figure 5: Type of attack

splenectomy,1patient undergone resection anastomosis of jejunal perforation and gastrojejunostomy in 1 patient. Chest drain were given in a 1 patient with traumatic pneumothorax due to elephant injury. Seven patients with lacerated injury by bull and cow were primarily repaired after through washing of wound and under antibiotic coverage. Four lacerated injuries over face by dog bite were primarily repaired after local antirabies Ig infiltration and iv antibiotic coverage (Figure 9). None of them developed secondary infection and recovered with good cosmetic outcome on follow-up.

Body parts	No.		%
Head, neck and face	05	Hard palate 1, soft palate 1, lips& gums 2, # mandible 1	22
Chest	02	Hematoma chest wall 1, # rib 1	09
Abdomen including Inguinal and peri-anal region	15	Peri-anal 08, Inguinal 4, Right lumber 1	61
Limbs (upper and lower)	02	UL 1, LL1	4+4

Figure 6: Parts of body injured by cow and bull horn

Parts	N (%)
Head,neck and face	10 (50)
Chest	00 (00)
Abdomen	01 perianal (5)
Upper limb	4 (20)
Lower limb	05 (25)

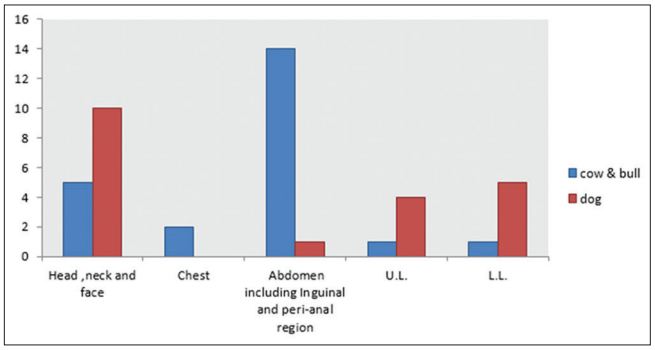

Figure 7: Parts of body involved in dog bite injury

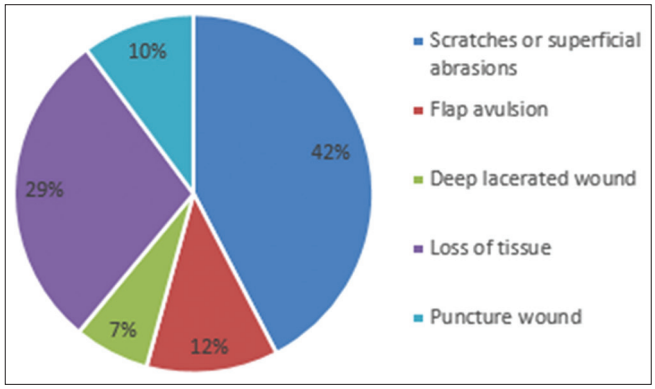

Figure 8: Types of wound

Intervention	No.	%
Exploratory laparotomy	05	8
Chest drain	01	2
Wound repair	07 Lips-2 Inguinal-4 Lumber region-1	12
Wound Repair With Ig infiltration	04	7
Conservative (including deep wound with tissue loss)	42	71

Figure 9: Management

DISCUSSION

In India, Bull gore injuries are frequently observed in villages. The wounds produced when a person is gored by a bull or other horned animal are commonly encountered in Spain, South American countries and in some part of Indiaon different festivals related with bull fighting.[1] Animals as cow, bull and dog are normally a docile and easily domesticated animals, may sometimes become angry for no obvious reason. These stray cattle may sometimes endanger the life of passers-by. The commonest site of injury in bull or cow horn cases is the abdomen and perineal region. The injuries predominantly occur on right side of abdomen. The reason for perineal involvement is its anatomical configuration leading horn hook to engage and penetrate. The injuries caused by horns of bulls, cows or buffaloes are of various shapes, sizes and directions and are goring in nature and violent. The wounds produced are contusions, lacerations, penetration of body cavities and rarely fractures. Mostly subcutaneous tissues and muscles are affected but visceral injuries are also encountered.[2] The maximum numbers of injuries are sustained in villagers while rearing the cows and bulls, during feeding, while tying them or milking the cows or buffaloes.

The risk factors for human dog bites identified in this study are very similar to those of other studies conducted elsewhere, mostly in developed countries.[3] For instance, dog bite injuries were more common in children, particularly those aged 5-9 years, and more common in males than females. Increased dog bite incidents in children is considered a behavioral risk because of their extreme curiosity, lack of inhibition, limited knowledge and experience about dog behavior, and inability to protect themselves from an attack.[4] It has also been suggested that bitesin children are more likely to be reported than in adults because of more parental concern towards children or the severity of theirinjuries. However, it is also believed that children in developing countries do not report minor bites or scratches to their parents, which increases the risk of rabies infection.[5]

Dog bite injuries to the lower extremities were more common (72%) than to other body parts, irrespective of the age of the victim in this study. This result is in contrast to some other studies in which more bite injuries were reported to the head, neck and face. Similarly, some other dog bite studies in developing countries have shown that stray dogs were commonly involved in bites to the extremities which is in agreement with our findings. Rabid dog bites to the upper body and extremities (head, neck, arm,hand) are more dangerous than bites to the lower extremities. The median risk of death following rabid dog bites to the head, hand, trunk and legs have been reported to be 45%, 28%, 5% and 5%, respectively. On the contrary, most victims (52%) reportedly did not wash their wound with soap and water at home before visiting the hospital for medical treatment. This finding suggests that a proper health educational program on rabies and wound care at home is required. Cleaning and flushing ofthe bite wound with soap and water immediately after being bitten is one of the most important steps recommended by the WHO. This procedure will remove much of the rabies virus from the wound and may considerably reduce the risk of contacting rabies (if the biting dog is infected with rabies) The presence of large numbers of stray dogs is a public health issue in India. Intervention measures should include public educational programs on dog behavior, dog-child interaction, and the importance of responsible dog ownership, particularly in children. Lessons on dog behavior, the risk of dog bites, bite wound management (e.g. washing with soap and water) and rabies can also be integrated into the elementary school curriculum to educate children on the public health hazard of dog bites.[4] Australia, Chapman et al. demonstrated that children who had been educated and provided information on ways to approach dogs displayed appreciably greater precautionary behaviors than children that did not receive any awareness education on dog behaviors and intervention.[5] Therefore, dog bite preventive education is important in children. Similarly, enforcement of regulations for licensing of dogs and vaccination, stray dog population management and animal birth control programs are important to reduce the bite incidents and post bite treatment cost.[6] One study in Spain has shown a significant decline in hospitalizations caused by dog bites after enactment of strict regulations on dog ownership. This suggests that a regulatory approach may also help in reducing dog bite injuries in addition to other educational programs.[7] Continuing surveillance of dog bites is necessary to detect trends and evaluate the effect of prevention efforts. For this, a national dog bite database and reporting system implemented through local primary health care centers may be appropriate for the surveillance and monitoring of dog bite incidents in Bhutan.[8]

Encounters with animals cause hundreds of fatalities, millions of nonfatal injuries, and cost hundreds of millions of dollars annually in the United States. In addition to inflicting traumatic injuries, animals transmit numerous zoonotic infections. Nonvenomous animals caused more fatalities than did venomous animals. In previous reports, as reflected by location of injury, most nonvenomous injuries are probably caused by farm animals.In a study of nonvenomous animal-related fatalities in Sweden from 1975 to 1984, horses and cattle caused 93% of the fatalities.[9] Males are more likely to die from venomous and nonvenomous animal-related injuries than are females. Children younger than 10 years and adults ages 65 and older appear to be at increased risk of death from dog attacks. The injury rate was

highestfor children ages 5 to 9 year. It is possible to decrease fatalities and serious injuriesfrom animal attacks. Children should be educated about the potential danger of animals, especially dogs. Helmets should be worn when riding horses. Individuals with a history of systemic reactions from insect stings shouldcarry epinephrine kits. Hikers and campers should check with rangers before embarking in bear and cougar territories. Swimmers should avoid areas where sharks are known to frequent, especially during times of the day when sharks are most likely to feed. Wild animals should not be fed, for this tends to make them less fearful of humans. If injured by a wild animal, an individual should seek medical treatment. Also, methods to prevent deer-vehicle collisionsare being evaluated.Continuing education of farmers and farm families about the hazards of working with large animals is important.

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Authors Contribution:
NM- Manuscript preparation, conceptualized the study, literature search, prepared the first draft of manuscript; **SSK**-Manuscript preparation, critical revision of manuscript, reviewed the literature; **YS**- Concept and design of study, literature search, collected data, statistically analyzed and interpreted; **PKG**- Literature search, helped in preparing first draft of the manuscript; **PK**- Concept and design of study, collected data; **MMN**- collected data, literature search

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