

## Original Article Orthopaedics

# EVALUATION OF INJURIES SUSTAINED IN ROAD TRAFFIC ACCIDENTS INVOLVING ANIMALS -A CROSS SECTIONAL STUDY

Dilip Kuncheria<sup>1</sup>, Padmanabhan<sup>2</sup>, Manoj Seval<sup>3</sup>, Aaron Jacob<sup>4</sup>, K Soman<sup>5</sup>, Sam Scaria<sup>6</sup>

<sup>1</sup> - Assistant professor, Govt. Medical College, Palakkad, Kerala

<sup>2</sup> - Director & Senior Orthopaedic surgeon, Govt. Medical College, Palakkad, Kerala

<sup>3</sup> - MBBS student, Govt. Medical College, Palakkad, Kerala

<sup>4</sup> - MBBS student, Govt. Medical College, Palakkad, Kerala

<sup>5</sup> - Head of Dept. of Orthopedics, Government Medical College, Palakkad

<sup>6</sup> - Lecturer, Dept. of General Surgery, Govt. Medical College, Palakkad,

### Corresponding Author:

Dr. Dilip Kuncheria  
Assistant professor,  
Govt. Medical College,  
Palakkad, Kerala-678013  
Ph-9249444881  
kuncheriasurgeon@gmail.com

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### Abstract

**Background:** Although traffic accidents involving animals are common in India, we are not aware of any series that reported human injuries caused by such accidents. There is an urgent need to study the unexplored area of trauma caused by animals. It may give insight in to the injuries sustained as a result of such accidents.

**Methods:** 152 patients who sustained road traffic accidents involving animals over a period of six month from December 2018 to May 2019 were evaluated. Epidemiological and other medical details were collected by direct interview and evaluation of the patients.

**Results:** 152 numbers of patients reported from 93 cases of road traffic accidents involving animals during the above period. 86 % of those reported were males. Age group of those reported were from 2.5 yrs. to 73 yrs. Two wheelers were the most common vehicle involved with 66% of them motor cycles. Most commonly involved among vehicle users were motor cycle riders followed by motor cycle pillion riders. Dogs were the most common animal involved in such accidents followed by pig. Mechanism of accident in 56% of cases is direct hit. Among the injuries sustained, soft tissue injury (78.7%) was the most common ones followed by fractures. Most common bone fractured in such accidents in our study was radius (25 %) with

fracture of the distal end radius as the commonest type. Second most common bone fractured was tibia (16%). Dislocations of the shoulder, acromioclavicular and metatarso- phalangeal joint are the ones recorded as most common in our study.

**Conclusion:** Road traffic accidents involving animals is a grey area which needs more attention. We were able to record 152 cases of such accidents in a short period of six months. Fractures of distal end radius were the most common type followed by tibial shaft.

**Keywords:** Road traffic accidents (RTA), Animals, fracture

## Introduction

Accidents involving animals are reported worldwide. Animal involved in these accidents varies in different countries<sup>1,2,3,4,5</sup>. It includes camels, kangaroo, deer etc.<sup>1,2,3,4,5</sup>. Data from these studies has helped in reducing such accidents by various remedial measures in respective countries<sup>5,6,7</sup>. Fauna sensitive road designs are implemented in many countries based on these studies<sup>8,9</sup>. Report on road accidents in India 2015, 2016 & 2017, by transport research wing, Ministry of road transport & highways, Govt. of India has mentioned the statistics on stray animals as cause of accidents. But the report doesn't go in to the details of road traffic accidents involving animals. Search of literature didn't reveal any study related to road traffic accidents involving animals. There is an urgent need to study the unexplored area of trauma caused by animals. These studies may help us to understand better about the injuries sustained in such accidents. The importance of protecting animals from injury due to vehicular traffic cannot be overstated; however this paper focuses on human casualties from such collisions<sup>10</sup>. Therefore, whilst it is acknowledged that many animals unfortunately die as a result of impact with a motor vehicle, a complete review of the animal welfare literature on this topic is beyond the scope of this paper.

## Aims and objectives of this research are

Epidemiology of such accidents  
Vehicle involved  
Mechanism of injury  
Type of injuries sustained

## Materials & Method

Study was conducted in

Department of Emergency & trauma care, Govt. Medical College, Palakkad. It is a 794 bed hospital with level III Trauma center. It has a patient drainage area of around 4478 km<sup>2</sup>.. This prospective study of road traffic accidents involving animals with. Study was started from December 2019 to May 2019

## Inclusion Criteria

- Patients reporting to Government medical college, Palakkad as a result of Road traffic accident involving animals
- All age groups
- Both sexes
- Both outpatients and inpatients

## Exclusion criteria

- Patients not reporting to Govt. medical college, Palakkad

All patients involved in road traffic accidents were initially managed as per ATLS protocol. They were thoroughly assessed for injuries and investigated as per requirement. Some of the patients with minor injuries were picked up from the outpatient department.

## Data collection technique and tools

Prospective study was conducted by direct interview of the patient. General information regarding the road traffic accidents were collected from the patients and bystanders. Injuries were evaluated and documented.

## Data analysis

Data entered in Microsoft Excel and analyzed statistical software SPSS. Descriptive statistics were calculated and presented as mean and percentages

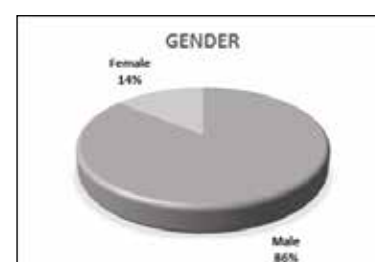
## Observations

1) **Period of study-** from

December 2018 to May 2019.

- 2) **In total of 93 cases of road traffic accidents involving animals, 152 number of patients reported**
- 3) **Age group of patients involved** – Lowest 2.5 yrs., highest- 73 yrs. and average age 14.22
- 4) **Sex distribution-** 131 male (86%) and 21 female (14%)

	Number	Percentage
Male	131	86
Female	21	14



## 5) Vehicle involved

Vehicle involved	Number	Percentage
Motor cycle	101	66
Scooter	26	17
Jeep	1	0.65
Auto	24	16.00
Total	152	

Vehicle involved	Number	Percentage
Two Wheeler	127	83.55
Three Wheeler	24	16
Four Wheeler	1	0.65

Two wheelers were the most common vehicle involved, with motor cycle as the most common among them

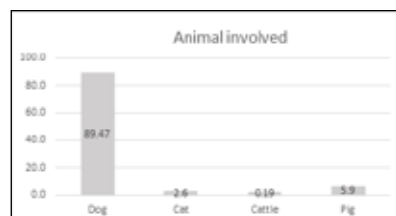
## 6) Details of those involved in the accident

	Number	%
Motor cycle & Rider	69	45.3
Motor cycle & Pillion rider	32	21.05
Scooter & Rider	17	11
Scooter & Pillion rider	9	6.0
Jeep & Driver	1	0.7
Auto & Driver	7	4.6
Auto & Passenger	17	11

44% of the patients who sustained RTA involving animals were motor cycle riders; next common is motor cycle Pillion riders

## 7) Animal involved

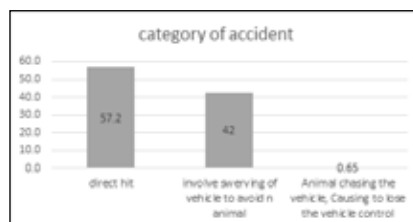
Animal involved	Number	%
Dog	136	89.47
Cat	4	2.6
Cattle	3	0.19
Pig	9	5.9
Total	152	100.0



**Dogs were the most common animal involved in such accidents followed by Pig**

## 8) Category of accident

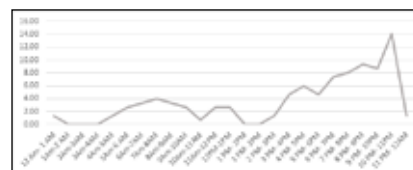
Category of accident	Number	%
Direct hit	87	57.2
Swerving of vehicle to avoid the animal	64	42
Animal chasing the vehicle, causing to lose the vehicle control	1	0.65



**85% of these accidents happened by the direct hit**

## 9) Accident timing

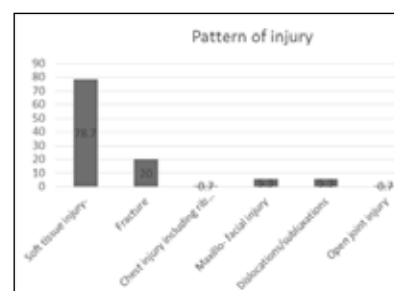
TIME	No of Cases	%
12 Am- 1 AM	2	1.33
1Am-2 AM	0	0.00
2Am-3AM	0	0.00
3Am-4AM	0	0.00
4Am-5AM	2	1.33
5Am-6 AM	4	2.67
6Am-7AM	5	3.33
7Am-8AM	6	4.00
8Am-9AM	5	3.33
9Am-10AM	4	2.67
10Am-11AM	1	0.67
11Am-12PM	4	2.67
12PM-1PM	4	2.67
1 PM- 2PM	0	0.00
1 PM- 2PM	0	0.00
2 PM- 3PM	2	1.33
3 PM- 4PM	7	4.67
4 PM- 5PM	9	6.00
5 PM- 6PM	7	4.67
6 PM- 7PM	11	7.33
7 PM- 8PM	12	8.00
8 PM- 9PM	14	9.33
9 PM- 10PM	13	8.67
10 PM- 11PM	21	14.00
11 PM- 12AM	2	1.33



**Road traffic accidents involving animals appears to be at the peak between 10 pm and 11 pm**

## 10) Pattern of injury sustained as a result of RTA involving animals

Pattern of injury	Number of patients	%
Soft tissue injury	118	78.7
Fracture	30	20.0
Chest injury including rib fractures	1	0.7
Maxillo- facial injury	8	5.3
Dislocations/ subluxations	8	5.3
Open joint injury	1	0.7



Among the injuries sustained, soft tissue injury (78.7%) was the most common ones followed by fractures (20%), maxillofacial injuries (5.3%) and joint dislocations (5.3%).

### 11) Pattern of soft tissue injury sustained

	Abrasion	Laceration	Bruise
Face	39	20	3
Shoulder	12	0	1
Arm	6	0	0
Elbow	30	1	1
Forearm	31	0	0
Hand	21	2	2
Chest	4	0	0
Scapula	1	0	0
Thoracic region	1	0	0
Lumbar region	1	1	1
Gluteal region	2	1	0
Abdomen	1	0	0
Thigh	7	0	1
Knee	41	6	2
Leg	19	2	3
Foot	20	7	0
Scalp	0	3	0

### 12) Pattern of fracture sustained

Limb	Bone	Fracture pattern	Number	Total
Upper limb bones	Radius	Radius shaft (Galleazi fracture dislocation)	2	8
		Distal end radius	5	
		Radial neck	1	
	Radius and ulna	Fracture both bone fore arm	1	1
	Ulna	Ulnar shaft	1	1
	Clavicle	Clavicle	4	4
	Humerus	Humerus neck	1	1
	Scapula	Coracoid process	1	1
	Phalanx hand	Phalanx	4	4
Chest	Ribs	Ribs	2	2
Lower limb bones	Femur	Greater trochanter avulsion fracture	1	1
	Patella	Patella	1	1
	Tibia	Tibial plateau fracture	1	6
		Tibia shaft	3	
		Medial malleolus	2	
	Fibula	Fibula shaft	2	2
	Metatarsal	Meta tarsal neck	1	1
	Phalanx foot	Phalanx	3	3
		Total		36

Fractures of the Upper limb bones (55.5 %) more common than lower limb bones (38.8%)

Most common bone fractured was radius (25 %) - This include distal end of radius fracture, Radius shaft as part of Galleazi fracture dislocation, fracture both

bone forearm, and radial neck.

Second most common bone fractured is tibia (16%). This includes tibia plateau fracture, shaft of tibia and fracture medial malleolus

Most common type of fracture pattern was distal end radius fractures

Fracture type	
Closed	34
open	2
Total	36

### 13) Dislocation/ subluxation Pattern

Dislocation/ subluxation	Number	%
Anterior dislocation Shoulder	2	25.0
Acromio-clavicular joint	2	25.0
Metatarso-phalangeal joint	2	25.0
Temporo-mandibular joint	1	12.5
Galleazi fracture dislocation	1	12.5

Most common joints involved in dislocations/subluxations were that of the shoulder, acromioclavicular and metatarso- phalangeal joint.

### 14) Maxillo facial injuries pattern

Maxillo facial injuries	Number	%
Maxillary antrum fracture	1	12.5
Zygoma fracture	2	25.0
Broken tooth	1	12.5
Teeth avulsion	3	37.5
Frontal bone fracture	1	12.5
Total	8	

Among the maxillofacial injuries recorded, tooth avulsions were the most common injury

### Conclusion

Age group of those involved in road traffic accidents (RTA) involving animals in our study ranges from 2.5

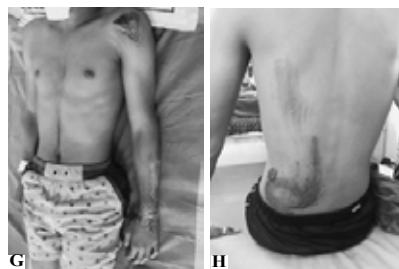
yrs. to 70 yrs. Males are common than females. It is the two wheeler users, esp. motor cycle riders and pillion riders who are most commonly involved such RTAs. Most common bone fractured in such accidents in our study was radius (25%) with fracture of the distal end radius as the commonest type. Second most common bone fractured was tibia (16%). Dislocations of the shoulder, acromioclavicular and metatarso- phalangeal joint were the ones recorded as most common in our study.

**Ethical Approval-** This study was approved by institutional ethics committee.

### Figures



**Fig 5- Various fractures sustained following road traffic accidents involving animals. A, B- comminuted fracture distal end of radius, C- Fracture neck of humerus, D- clavicle fracture, E- fracture both bone leg, F- Avulsion fracture greater trochanter**



**Fig 4- A, B, Abrasions were the most common type of injury sustained in Road traffic accidents involving animals**

### Reference

1. Abu-Zidan, F., & Parmar, K. (2002). Kangaroo-related motor vehicle collisions. *Journal of Trauma-Injury Infection & Critical Care*, 53(2), 360-363.
2. Al-Sebai, M.W., & Al-Zahrani, S. (1997). Cervical spinal injuries caused by collisions of cars with camels. *Injury*, 28, 191-194.
3. Ansari, S., & Ashraf, A. (1998). Camel collision as a major cause of low cervical spinal cord injury. *Spinal Cord*, 36, 415-417.
4. Attewell, R., & Glase, K. (2000). Bull bars and road trauma. Report CR200. Australian Transport Safety Bureau: Canberra.
5. Hedlund, J. H., Curtis, P. D., Curtis, G., & Williams, A. F. (2004). Methods to reduce traffic crashes involving deer: What works and what does not. *Traffic Injury Prevention*, 5(2), 122-131.
6. Lintermans, M (1997). A review of the use of swareflex wildlife reflectors to reduce the incidence of road-kills in native fauna. Retrieved 3/11/04 from <http://www.newcastle.edu.au/discipline/biology/marsupialcrc/actkanga3/appd.html>.
7. Ramp, D, & Croft, D. (2006). Do wildlife warning reflectors elicit aversion in captive macropods? *Wildlife Research*, 33, 583-590.
8. Sullivan, T. L., Williams, A. F., Messmer, T. A., Hellinga, L. A., Kyrychenko, S. Y. (2004). Effectiveness of temporary warning signs in reducing deer-vehicle collisions during mule deer migrations. *Wildlife Society Bulletin*, 32(3), 907-915.
9. Queensland Department of Main Roads (2000). Fauna sensitive road design. Volume 1 – past and existing practices. Queensland Department of Main Roads, Planning, Design and Environment Division: Brisbane.
10. Rowden, Peter J. and Steinhardt, Dale A. and Sheehan, Mary C. (2008) Road crashes involving animals in Australia. *Accident Analysis and Prevention* 40(6):pp. 1865-1871