

Original Research Article

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Explorative Analysis on the Mortality Pattern of Wild Animals at Territorial Forest Division Jabalpur, India

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ABSTRACT

A study was conducted to know the mortality pattern in wild animals received from rescue teams in Non Protected Areas of Territorial Forest Division Jabalpur, Madhya Pradesh. A total of 104 deaths were recorded in seventeen different species of wild animals during the period from April 2015 - March 2017. The cause specific mortality was determined on the basis of data available from primary and secondary resources. The history and patho-anatomical changes observed at necropsy were recorded among animals brought at the School of wildlife Forensic and Health, NDVSU, Jabalpur, MP, India. The prime cause of deaths among wild animals were traumatic shock (42.31%), followed by respiratory failure (15.38%), drowning (13.46%), hypovolemic shock (3.85%), lung oedema (1.92%) and septicaemia (1.92%), while capture myopathy, electrocution and heat stroke were also reported each at the level of (0.96%). Remaining 18.27% of the carcasses showed autolytic changes. It is necessary to conduct periodic studies on the mortality pattern among wild animals to know the factors affecting their survival and take steps to prevent large scale morbidity and mortality. The study also emphasises the significance of scientific handling during rescue operations in prevention of animal mortalities at Territorial Forest Divisions.

Keywords

Mortality pattern, Free range, Rescue, Territorial Forest Division

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Introduction

The wild animals and plants are important constituents of ecosystem and are essential to maintain equilibrium of various natural processes like temperature, rainfall, soil fertility etc. Uncontrollable human population growth leading to the industrialization and urbanization is rapidly replacing natural habitat, local vegetation and decreasing free space for wild animal's day by day (Donald *al.*, 2004). This inter-specific competition for resources between human and wild animals

has caused a decline in population of free range wild animals. The growing livestock population has created a competition for feed and fodder by overgrazing surrounding forest area causing a local decline in the population of wild herbivores (Mishra *et al.*, 2003). The seasonal variation also causes a change in their diet and prey so these wild animals move from one place to other in search of prey which exposes them to two different adverse conditions like road accidents and human-wildlife conflict leading to more mortality of animals (Patterson *et al.*, 2004).

Wildlife mortality due to chasing by dogs, injury, falling in canal, heat stress and road accidents have caused considerable damage to their population in non protected areas in the past years. The condition is more critical in and around non protected areas of developing urban settings. Unfortunately, systemic studies on the mortality pattern in non protected areas are scarce and those available focused primarily on a few large mammals. Nevertheless, many species are found as victims and their mortality is probably underestimated. The analysis on mortality pattern in free range wild animal population is bit challenging because most such deaths go unobserved. Moreover, it is also difficult to diagnose the cause of mortality, whether it is natural or due to unnatural factors. Therefore, the present study was conducted to explore the mortality pattern and causes of deaths among wild animals received from rescue teams at Territorial Forest Division Jabalpur.

Materials and Methods

The study area Jabalpur is located in the Mahakoshal region of Madhya Pradesh, India and geographically, located between latitude 23° 10' N and 23° 17'N and longitude 79° 57'E and 79° 95'E. The work was carried in Territorial Forest Division Jabalpur during April 2015 - March 2017. The cause of death of animals died during this period was determined based on necropsy examination. Data were also collected from the primary resources (Singh and Sharma, 2011) and secondary resources (Cnossen, 1997). The necropsy examination and analysis of data was conducted at the School of Wildlife Forensic and Health, NDVSU, Jabalpur, MP, India.

Results and Discussion

Present study analyses a total of 104 death cases of wild animals out of which maximum deaths occurred due to traumatic shock

(42.31%) followed by respiratory failure (15.38%), drowning (13.46%), hypovolemic shock (3.85%), lung oedema (1.92%) and septicaemia (1.92%), while capture myopathy, electrocution and heat stroke were reported each at the level of (0.96%). Autolytic changes were reported in (18.27%) of the carcasses (Table 1, Fig. 1 and Plate 1).

Deaths of pariah kite, pangolin, porcupine, black buck and tigress cub were reported due to traumatic shock. The death of 2 leopards was reported due to respiratory failure, while autolytic changes were recorded in other 2 carcasses. The necropsy of 3 cobras revealed their deaths due to respiratory failure. Carcasses of a sand boa and a crocodile were putrefied and showed autolytic changes. Traumatic shock and electrocution were the causes of mortality in common langur. Among peafowl the mortality was reported due to traumatic shock in 2 and lung oedema in 1; while autolytic changes were reported in 1 carcass.

The necropsy findings in chital showed maximum percentage of animals dying due to traumatic shock (50.88%) followed by respiratory failure (14.04%), hypovolemic shock (7.02%), drowning (3.51%); capture myopathy, lung oedema, septicaemia and heat stroke each three at the level of (1.75%); while 17.54% of the carcasses showed autolytic changes.

The necropsy findings in barking deer showed maximum animals dying due to traumatic shock (50%), followed respiratory failure and drowning each at the level of 16.67%; while autolytic changes were reported in 16.67% of the carcasses. Death of sambhar was reported due to traumatic shock (50%) and respiratory failure (50%). Septicaemia was recorded in carcass of a nilgai. Traumatic shock (25%) and autolytic changes (75%) were seen in wild boars (Table 1, Fig. 1 and Plate 1).

Table.1 Mortality pattern in wild animal during 2015-17

S. No	Species	Traumatic shock No. (%)	Respiratory Failure No. (%)	Hypovolemic Shock No. (%)	Capture myopathy No. (%)	Autolytic changes No. (%)	Drowning No. (%)	Lung oedema No. (%)	Septicaemia No. (%)	Electrocution No. (%)	Heat stroke No. (%)	Total Number
1.	Chital	29 (50.88)	08 (14.04)	04 (7.02)	1 (1.75)	10 (17.54)	02 (3.51)	01 (1.75)	01 (1.75)	-	01 (1.75)	57
2.	Barking deer	03 (50)	01 (16.67)	-	-	01 (16.67)	01 (16.67)	-	-	-	-	06
3.	Black buck	01 (100)	-	-	-	-	-	-	-	-	-	01
4.	Sambar	01 (50)	01 (50)	-	-	-	-	-	-	-	-	02
5.	Nilgai	-	-	-	-	-	-	-	01 (100)	-	-	01
6.	Wild boar	01 (25)	-	-	-	03 (75)	-	-	-	-	-	04
7.	Rhesus macaque	-	01 (8.33)	-	-	-	11 (91.67)	-	-	-	-	12
8.	Common langur	01 (50)	-	-	-	-	-	-	-	01 (50)	-	02
9.	Peafowl	02 (50)	-	-	-	01 (25)	-	01 (25)	-	-	-	04
10.	Pariah kite	01 (100)	-	-	-	-	-	-	-	-	-	01
11.	Pangolin	03 (100)	-	-	-	-	-	-	-	-	-	03
12.	Porcupine	01 (100)	-	-	-	-	-	-	-	-	-	01
13.	Crocodile	-	-	-	-	01 (100)	-	-	-	-	-	01
14.	Tigress (cub)	01 (100)	-	-	-	-	-	-	-	-	-	01
15.	Leopard	-	02 (50)	-	-	02 (50)	-	-	-	-	-	04
16.	Cobra	-	03 (100%)	-	-	-	-	-	-	-	-	03
17.	Sand boa	-	-	-	-	01 (100%)	-	-	-	-	-	01
	Grand Total	44 (42.31)	16 (15.38)	04 (3.85)	01 (0.96)	19 (18.27)	14 (13.46)	02 (1.92)	02 (1.92)	01 (0.96)	01 (0.96)	104

Fig.1 Necropsy changes in wild animals recovered during rescue operation (2015-2017)

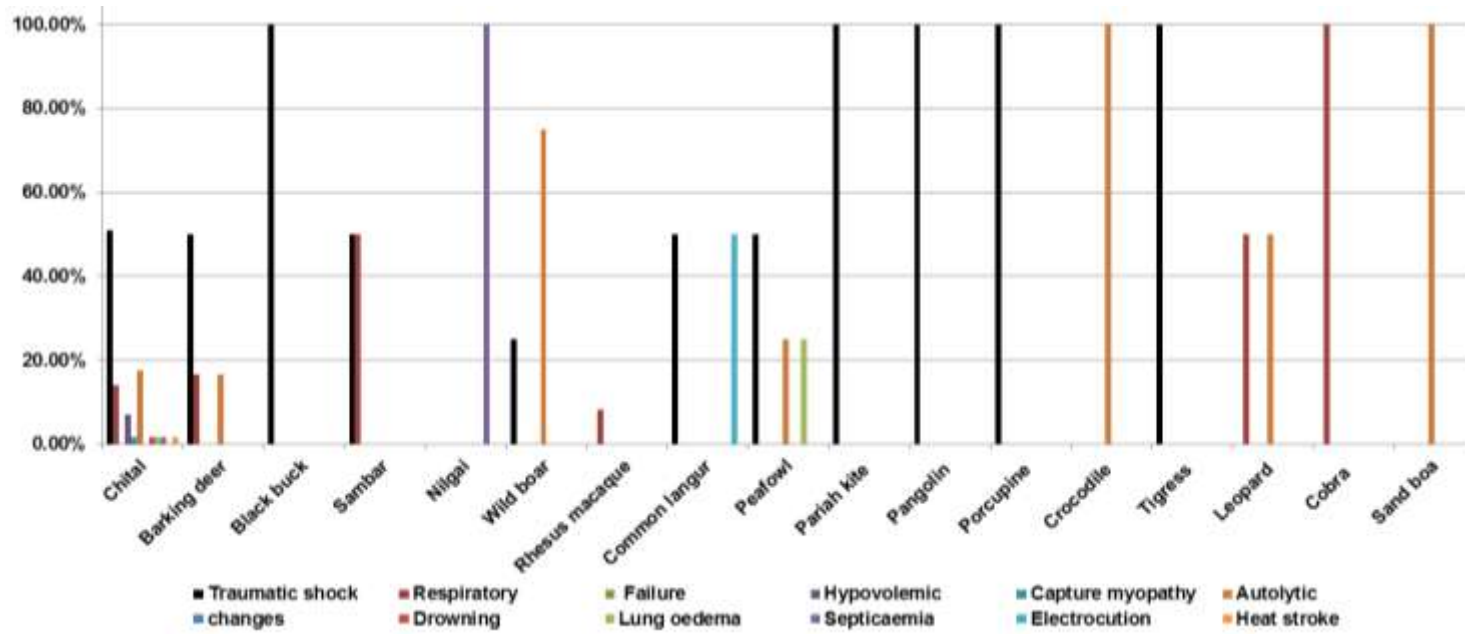


Plate.1 Necropsy examination of wild animals

- (a) Extensive hemorrhages in medial aspect of neck region due to severe trauma in a chital
- (b) Dog bite injuries in perineum and medial aspect of thigh in a chital
- (c) Congestion in respiratory tract of a cobra



(a)



(b)



(c)

Among animals died while being brought for treatment, the unscientific transportation, improper handlings leading to skin abrasion, lacerations, muscular injury, hoof injury, antler injury, strangulation due to strings and fracture were recorded. During the necropsy examinations major lesions reported were skin abrasions, lacerations, subcutaneous congestion, haemorrhages, muscular injuries, fractures and haemothorax. The findings of the investigation of Swamy *et al.*, (2016) reports most of the mortalities in free ranging wild animals due to respiratory failure resulting from road trauma, drowning, suffocation and strangulation.

Similar kind of studies was conducted by Kumar *et al.*, (2012) on the mortality causes in 113 wild animals died at Shivalik hills in Himachal Pradesh. The necropsy findings revealed musculoskeletal injuries in 68.14% (77); more specifically fractures 37.16% (42) and fatal traumatic injuries 30.97% (35) as most common cause of mortality in all the animals. Mortality due to septicemic conditions was observed in 8.84% (10) of died animals. Obendorf (1983) conducted necropsy of 44 wild koalas (24 males and 20 females) from several locations in Victoria, Australia and the commonest reason of deaths were traumatic injuries resulting from motor vehicle accidents and intra-specific conflict. The strong association between wild animals, human beings and domestic animals has become important now-a-days as there was found involvement of wild animals in transmission of certain inter-species as well as intra-species diseases.

Acharjyo and Rao (1987) documented the rescue cases in and around Biological Park, Bhubaneswar which reports mortality due to animal chasing by dogs followed by falling into moat. The authors also reported 4.3% mortality during rescue due to drowning in a period of five year. Arora (2003) proposed the chance for variation in health status from normal range due to capture stress i.e. chemical immobilization, nutritional and health status. The former factor is difficult to be eliminated and depends mostly

on the nature of habitation (wild, semi-captive, captive) and the extent of domestication.

Among rhesus macaques maximum percentage of animals died due to drowning (91.67%), followed by respiratory failure (1.75%). The necropsy findings in common langur showed equal percentage of animals dying due to traumatic shock and electrocution with each at the level of (50%). Sengar *et al.*, (2014) reported a case of electrocution injury in a common langur wandering in search of food and water. They proposed that electric current passing through the animal body may cause coma and death, if the current is sufficiently strong. Nath and Chakraborty (2013) reported 27 deaths in six different species of non human primates.

The necropsy findings in a pariah kite showed death of the bird due to traumatic shock. Arora (2003) emphasized that capturing wild birds causes injury, shock and death in millions each year. He further stressed that transportation of birds is not risk free particularly during summers.

It is the general behaviour of an animal to escape while being captured. However, deer are at high risk of stress, shock and capture myopathy while they are being handled prior to their transport from one place to another. The risk increases if the deer with antlers or in velvet are allowed to struggle during their capture or restraint and the process is carried out in hot weather. The study findings were indicative of various kinds of injuries and stressful conditions animals suffer during rescue operations, which can be improved through scientific handling and transportation of animals.

In conclusion, the study signified that the analysis on mortality pattern of wild animals at Territorial Forest Divisions is of utmost importance to reveal the factors affecting animal survival, so as to take measures to prevent large scale morbidity and mortalities and ensure effective wildlife conservation. For

this purpose it is important to perform scientific necropsy examination of each wild animal to know the causes of deaths and take precautionary measures to prevent large scale mortalities. Lack of proper handling of animals could lead to animal mortalities. The success of rescue operations depends chiefly upon the scientific handling of animals which not only avoid distresses in wild animals but also prevent mortalities. It is need of the hour to prepare and adopt standard operating procedures for rescue and handling of wild animals at Territorial Forest Divisions and develop trained human resources for handling such situations.

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