

Mortality Pattern in Captive Wild Carnivores in Maharashtra State

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Abstract

A total of 244 deaths were recorded in seven different species of captive wild carnivores which reveal highest mortality in lion 92 (37.70 %) followed by 60 (24.59 %) in tiger and leopard respectively. Lowest mortality was recorded in rest of felines. Similarly region wise and season wise mortality summarized. Disease symptom wise mortality pattern revealed involvement of respiratory affection in 56 (22.95 %) followed by digestive 46 (18.85 %) miscellaneous 40 (16.39 %) and generalized conditions 39 (15.98 %). The causes of death attributed to specific diseases in carnivores 13 (5.31 %) showed trypanosomiasis, hookworm in tiger, trypanosomiasis in jungle cat, fox and pasteurellosis in lion and leopard. From study it is concluded that pattern of mortality in carnivores is serious concerned in captive wildlife conservation and these losses due to mortality can be controlled to considerable extent by taking appropriate measures (Veterinary aid) well in time.

Keywords: Captive Wild Animals, Carnivores, Mortality,

Introduction

India's wild life possesses many endangered species of wild animal and is last paradise for Asiatic lion. Diseases in wildlife other than those in species of economic importance or diseases of public health significance have long been overlooked and thus are rarely monitored. Disease agent must be considered as integral in shaping any aspects of wildlife behaviour and ecology.

Though disease is a major decimating factor among Indias wildlife with some instances of species being extirpated locally. However no systematic study has been undertaken to find out impact of disease in wild animals with respect to mortality. Diseases are one such factor that has potential significance for survival of species. Its impact on population dynamics however can only be accessed by determining prevalence of existing and or emerging disease problem which is prerequisite. Retrospective study on mortality of wildlife will help in formulating strategies to prevent and control wildlife diseases.

Materials and Methods

The records pertaining to mortality in respect of seven species of captive wild carnivores a of the

following locations were examined.

Sr. Zoo	Duration
1. Maharajbagh Zoo, Nagpur	1962-2002
2. Sidharth Zoo, Aurangabad	1988-2002
3. Peshwe Park, Pune	1996-2002
4. Rana Pratap Singh Udyan, Sangli	1988-2002
5. Vir Mata Jijabai Udyan, Bhaikhala	1988-2002
6. SGNP, Borivali	1996-2002

A total of 244 deaths were recorded. Data pertaining to history, date of arrival, birth, age, sex, species, date and cause of death were examined

The different animals group studied on the basis of feeding behaviour with family.

Carnivores Felidae Tiger, Lion, Leopard, Jungle cat, Civet Cat , Anidae Fox, Hyaenidae Hyena

Animals were divided into two age groups 0-5 years as young and above five years adults according to age in years. The cause of death was determined on the basis of postmortem examinations conducted at local zoological park. Postmortem examinations however confirmed different causes of death. Thus various causes of death group together on the basis of system affected specific diseases and miscellaneous causes (Fraser et al. 1991).

Table-1 a: Species and Disease Systemwise Mortality in Captive Wild Carnivores.

Sr.	Species	D	R	C	U	G	P	Others	Misc	Specific	Total
1.	Tiger	13(21.66)	15 (25)	6(10)	3 (5)	6(10)	1(1.66)	5(8.33)	7(11.66)	4(6.66)	60(24.59)
2.	Lion	17(18.47)	18(19.56)	9(9.78)	1(1.08)	12(13.04)	1(1.08)	16(17.39)	17(18.47)	1(1.08)	92(37.72)
3.	Leopard	7(11.66)	17(28.33)	3(5)	–	15(25)	1(1.66)	2(3.33)	13 (21.66)	2(3.33)	60(24.59)
4.	Fox	3(16.6)	5(27.77)	2(11.11)	–	4(22.22)	–	–	1(5.55)	3(16.66)	18(17.37)
5.	Hyaena	1(20)	–	–	–	–	–	–	2(40)	1(20)	5(2.04)
6.	J.Cat	1(50)	–	–	–	–	–	–	–	1(50)	2(0.81)
7.	C Cat	4(57.14)	–	–	–	2(28.57)	–	–	–	1(14.28)	7(2.86)
	Total	46(18.85)	56(22.95)	20(8.19)	4(1.63)	39(15.98)	3(1.22)	23(9.42)	40(16.39)	13(5.32)	244(100)

D= Digestive System, R=Respiratory System, C=Cardiovascular System, U=Urinary System, G=Generalised Condition, P=Physical Influence

Result and Discussion

In all seven species of captive wild carnivores from different locations surveyed to study mortality pattern and results presented. It is observed that in felines highest mortality rate 92 (37.70 %) was recorded in lion followed by 60 (24.59 %) in tiger and leopards respectively, while lowest mortality recorded in rest of felines. In lion recorded mortality was 23 (25 %) at Nagpur, 4(4.34 %) at Aurangabad 9(9.78%) at Borivalli, 6(6.52%) at Bykhalla and 50 (54.34 %) at Sangli Zoo respectively.

The general objective of disease management is to reduce contact between infected and non infected animals. Enforced separation in infected and non infected individual is difficult to attempt presently in the zoos. The objective of selective removal of disease animals from population is to reduce the amount of infective material available and to curb spread of disease to healthy population on considering the floor spaced area and cage designs available for carnivore's species. It is very likely that infection maintained in environment and these animals are ever threatened resulting heavy estimate of mortality can be attributed to persistent exposure to infection and non observance of quarantine so as to break cycle of transmission. Similar observations were made by Rao and Acharjyo (1993).

Family and disease system wise mortality pattern showed highest mortality 47.73 recorded in felidae. Within this family 20.6 % death were recorded due to respiratory system 22.63 % followed by digestive 19 %, generalized conditions (16.28 %) and cardiovascular systems(8.14 %). In feline respiratory inspection includes number of viral and bacterial diseases that affect upper airway, bronchi and lung (Fowler 1986). The survival of microbial agent outside of host animal is influenced negatively by increased temperature and

ultra violet irradiation and positively by humidity. It is pertinent to note that this is important in many zoos owing to availability of enclosures, thus allowing directly the influence of availability of viable organisms. Pathogenic floating material likely to concentrate in areas used by captive felids and affect distribution of systemic involvement (Chakraborty 1996).

About 19 % deaths recorded in present study found due to involvement of digestive system similar findings were reported by (Hyslop 1955). However Rao and Acharjyo (1996)encountered digestive disorders in 7, 13, 6 and 8 tiger, lion, leopard and lesser cats.

Amongst felines 244 deaths analyzed (Table 1a) system wise major affection revealed respiratory 56 (22.95%). Followed by digestive 46(18.85%), miscellaneous 40(16.39%), generalized conditions 39(15.98%). The findings of present study are in accordance with (Srivastava and Chakraborty, 2002) reported that maximum mortality of tigers is due to respiratory diseases.

Rathore and Khera (1981a) and Rao and Acharjyo (1994) were of the opinion that these conditions developed in captive animal probably due to faulty management and malnutrition etc. In present study it can be precluded that aforesaid conditions followed by death in captive carnivores probably due to difficulty in recognizing the abrupt changes in activity pattern of sick animal by the time diseases progressed to near fatal condition. In addition to above the response to therapy and consequently recovery rate appeared to be poor due to lack of facilities and accurate diagnosis.

In felines 13 (5.31%) cases of death (Table 1b) were attributed to specific diseases like trypanosomiasis, hookworm in tiger, babesiosis and pasteurellosis in lion, leopards, trypanosomiasis in jungle cat and fox. Rathore and Khera(1981a) were also in agreement with present findings.

Table-1 b: Specific Disease recorded in Captive Wild Carnivores.

Sr.	Species	Tuberculosis		Pasteurellosis		Trypanosomiasis		Rabies		Babesiosis		Hookworm		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1.	Tiger	--	--	--	--	1	25	--	--	--	--	3	75	4	30.76
2.	Lion	--	--	1	100	--	--	--	--	1	100	--	--	2	15.38
3.	Leopard	--	--	1	33.33	--	--	1	33.33	1	33.33	--	--	3	23.07
4.	J Cat	--	--	--	--	1	100	--	--	--	--	--	--	1	7.69
5.	C Cat	--	--	1	100	--	--	--	--	--	--	--	--	1	7.69
6.	Fox	--	--	--	--	1	100	--	--	--	--	--	--	1	7.69
7.	Hyena	--	--	--	--	--	--	1	100	--	--	--	--	1	7.69
	Total	--	--	--	--	--	--	--	--	--	--	--	--	13	100

Incidence of mortality in different families of wild carnivores in relation to age and sex (Table 3) showed in felines overall highest mortality recorded in young 120(63.49%) followed by adults 101(36.83%) of which 121(50.83%) were male and 100(49.840 females). In present findings incidence of mortality with respect to age and sex mostly in young group probably due to juvenile deaths which remained unrecorded and managerial, hygienic factors of zoos.

Season wise highest mortality in felines reported in summer followed by winter and rainy (Table 2). Highest mortality in summer attributed to heat stress leading to loss of vitality and energy due to high temperature in captive environment as compared animals in free living state substantiated fact that the stress phenomenon includes interaction with reduced

appetite thereby cause increase in disease susceptibility (Arora, 1986).

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