Health Status of Captive Asian Elephants in Chitwan National Park, Nepal

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Introduction

Once abundant throughout the lowland forests of Nepal, Asian elephants (*Elephas maximus*) are increasingly under the risk of extirpation owing to rapid human population growth and subsequent resource demands including poaching (Kharel 2001). The population of resident wild Asian elephants in Nepal has been estimated to be between 109-142 animals (DNPWC 2008) occurring in four isolated populations (Eastern, Central, Western, and far-western) (Pradhan *et al*. 2011) and inhabit an area covering about 10,982 km^2 of forest (DNPWC 2008).

Nepal has a long history of capturing, taming, and use of elephants. The Department of National Parks and Wildlife Conservation (DNPWC) has been the government institution responsible for the management of domesticated elephants since 1978 (Pradhan *et al*. 2011). Currently, there are a total of 208 captive elephants in Nepal of which 94 are owned by Protected Areas (government), 8 by the National Trust for Nature Conservation - a national NGO, and 106 are privately owned. Captive elephants are used for patrolling parks, forest excursions, tourism, and research activities. With the recognition of the importance of captive elephants, the Nepal Government established an elephant breeding center at Chitwan National Park in 1986.

Asian elephants are susceptible to various infectious and non-infectious diseases. Infectious and parasitic diseases include tetanus, tuberculosis, hemorrhagic septicemia, salmonellosis, anthrax, foot and mouth disease, rabies, pox, herpes virus infection, mycosis, surra, piroplasmosis, 'bots', toxoplasmosis, helminthiasis and ectoparasitism (Fowler & Mikota 2006; Firyal & Nureen 2007; Chandrasekharan *et al*. 2009; Gairhe 2012). Thus, regular examination and investigation of potential diseases in captive populations is of utmost importance for effective management. Moreover, such investigation can potentially provide an early indication of disease transfer between captive and wild populations. In the present study we investigated the prevalence of different diseases in government owned captive elephants at Chitwan National Park.

Material and methods

The study was based on the analysis of disease records from 2004-2009. Diseases were categorized as infectious or non-infectious. Non-infectious diseases were further categorized based on affected organs. Since the data on frequency of disease attacks were not available, prevalence was calculated as the proportion of recorded cases of a particular disease among all records.

The diseases were diagnosed by a senior veterinary officer of the Chitwan National Park based on clinical signs and symptoms, postmortem lesions, and laboratory findings. However, confirmatory diagnoses were limited in some cases due to insufficient laboratory facilities.

Results and discussion

A total of 66 captive elephants were represented in the disease records, of which 10 died during the study period. Tuberculosis was the major cause of death (n=5). Other identified causes were anthrax, dystocia, endotheliotrophic elephant

herpes virus, rupture of nuchal ligament, and leg fracture (n=1 each).

In total 213 records of disease were assessed. Prevalence of tuberculosis was 6.5% of the cases (Table 1). Diagnosis of tuberculosis in the elephants was based on the elephant TB STAT-PACK® test supported by Elephant Care International. Caused primarily by *Mycobacterium tuberculosis* and with clinical signs comparable to those observed in humans, tuberculosis in elephants has been recognized for over 2000 years (McGaughey 1961). It has been the most frequently recorded disease among Asian elephants elsewhere too, with fatal consequences (Barnes & Barrows 1993; Chandrasekharan *et al*. 1995; Gaborock *et al*. 1996).

Prevalence of gastrointestinal helminthosis (GIH) was 19.2% of the recorded cases. Digestive disorders observed included colic, drooling saliva, diarrhoea, colon impaction, indigestion, anorexia and bloat and their prevalence was 8.4%. Notably, one elephant had saliva drooling since its birth and was eight years at the time of the study. It was thinner than its counterparts albeit undergoing drug therapy. Mud-eating was recorded in 8.4% of cases, which is suggestive of inadequate nutrition.

Disorders related to eye, tail and foot were also common. Epiphora and corneal opacity were prevalent in 4.5% of the records. Tail disorders consisting of bitten tail, swollen tail base, and malicious tail chopping was found in 3.3% of the records. Whether anyone was apprehended for misdemeanors such as chopping off tails was unknown. Elephant tail hair is a symbol of good luck in Nepalese society and is used in bracelets. Thus, malicious chopping of tail could be for obtaining the tail hair.

Foot problems consisted of lameness, foot rot wound, infected foot pad, over worn sole, cracked sole, cracked heel, overgrown sole, overgrown nail, split nails, ingrown nails, overgrowth of cuticle, wounds and abscesses. About 11.3% of the records had foot disease, which was presumably due to wet and dirty barn conditions and inadequate exercise. Treatment included regular dressing and surgical treatment. Surgical problems included wounds, abscesses, hematomas, hygromas, and pricked soles and were prevalent in 20.2% of the records. Most of the surgical problems were traumatic in origin. Wound dressing and antibiotic therapy were regularly practiced.

Table 1. Prevalence (in %) of different diseases in government owned captive elephants at Chitwan National Park.

Disease	Records	Prevalence
Infectious disease		
Tuberculosis	14	6.5
GIH	41	19.2
Non-infectious disease		
Digestive disorder	18	8.4
Mud eating	18	8.4
Skin disorder	7	3.2
Eye disorder	10	4.7
Ear disorder	1	0.5
Reproductive problem	3	1.4
Surgical problem	43	20.2
Foot disorder	24	11.3
Insect bite	2	0.9
Joint disorder	2	0.9
Tusk disorder	3	1.4
Tail disorder	7	3.3
Non specific problems	20	9.4

Reproductive problems observed were dystocia, agalactia, tearing of vagina and suspected endometritis and were observed in three captive elephants. Endometritis was suspected due to a continuous purulent discharge from the vagina after calving. Dystocia with continuous muco-purulent discharge from the vagina for more than 30 days was found to be the cause of death of a female elephant. Two cases of fetal retention were successfully handled by episiotomy with manual traction. Agalactia was seen in an elephant that had a twin birth of male calves.

Skin disorders included allergic dermatitis and depigmentation on neck, skin, belly, etc. Depigmentation was suspected to be of fungal or viral in origin and tended to increase with age.

Antipruritic preparations and anti-inflammatory therapy were prescribed for it.

To lesser extents, disorders were related to ears, joints and tusks. Tympainitis was found in two individuals. Two elephants had joint problems suspected to be rheumatism and arthritis. Tusk disorder was prevalent in about 1.4% of the cases presumably due to manual work. Two of the elephants had insect bites that were treated with antihistamine.

Non-specific problems recorded were weakness, debility, fever, ventral edema, lying down and behavioral problems. Causes of ventral edema were recent delivery of a newborn, hypoproteinemia, poor food quality, iron deficiency, and liver fluke infection.

Acknowledgements

We would like to thank the Institute of Agriculture and Animal Science, Rampur for funding. We also highly appreciate Dr. Dinesh Kumar Singh and Dr. Kamal P. Gairhe for their invaluable suggestions in this study.

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