Traumatic injury and stress related death of non-human primates in Assam State Zoo

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Abstract

Occurrence of traumatic injury in non-human primates is common. Stress-related diseases are an important cause of death for many animals. During capture of wild animals, physical, environmental and psychological factors affect animals and the stress associated with capture and capture myopathy can cause mortality of the animals. In the present study, death due to traumatic injury and stress in a male rhesus macaque and a female slow loris, respectively, were recorded in the Assam State Zoo. The note suggests that proper care and management practices in captive non-human primates can reduce the number of deaths due to traumatic injury as well as stress.

Fig.1: Injury on the head region of a *Rhesus macaca*

Introduction

Traumatic injuries are common place in non-human primate facilities (Rand, 2010). Most of the injuries in non human primates occur due to fighting. The most frequently encountered injuries typically involve the hands, feet or tail. These injuries can be quite extensive and may require amputation of digits and/or portions of the tail. In group-housed animals, fighting may result in crushing injuries characterized by areas of marked soft tissue damage (bruising). These injuries are often difficult to detect because of the length of an animal's hair as well as the lack of a major laceration and external hemorrhage. The selective impact of illness and injury of non-human primates may take several forms, by affecting reproductive success through sub adult mortality, mortality during reproductive years, restriction of a female's ability to care for her offspring, and impairment of male and female competition for mates (Lovell, 1991).

Stress-related diseases are an important cause of death in many animals, including humans. (Herbert & Cohen 1993; Moberg, 2000). Rathore & Khera (1981) conducted a survey in 11 zoos in India and they observed that 14-40% of deaths were due to traumatic injury or accidents. Goswami (1994) studied the patholological conditions of 85 captive non-human primates in Assam State Zoo and death due to traumatic injury and stress were recorded in 10 (11.76%) and 8 (9.41%) animals respectively.

Materials and methods

In the present study, 27 non-human primate carcasses of Assam State Zoo and Department of Forest and Environment, Govt. of Assam were examined during the period from December, 2007 to November, 2009. The gross lesions were recorded and tissue samples preserved in 10% formal-saline solution and were processed and stained by routine haematoxyline and eosin (H&E). The tissue samples of lung, liver, kidney, heart and intestine were collected for bacteriological and fungal examination. Special staining technique/methods such as Brown and Brenn stain for gram-positive and gram-negative bacteria, Zeihl-Neelsen's for acid fast organisms and modified Periodic Acid Schiff (PAS) were undertaken for fungus.

Result

Out of 27 non-human primates examined, death due to traumatic injury and stress were recorded in a male rhesus macaque and a female slow loris in Assam State Zoo respectively. In the traumatic injury case, the macaque had fight with another macaque in the enclosure; as a result, the macaque was severely injured resulting in fracture in the thoracic part of the vertebral column. Externally, injury was prominent on the head (Fig. 1) and neck

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region. At post mortem examination, the liver showed rupture and clotted blood was found in the abdominal cavity. Pneumonic lesion was observed in the lung characterized by mild congestion in the pulmonary capillaries and mild haemorrhage in to the alveoli. No any organism was cultivated from collected tissue samples.

A female slow loris of Assam State zoo died within three days on arrival there. The animal refused to take food and became weak. It was treated against anorexic condition. No significant lesions could be recorded at post mortem examination; however, mild enteritis and mild pneumonia were noticed. Light colored skeletal and cardiac muscles were observed at necropsy. Histopathological examination revealed slight thickening of interalveolar septa in the lung. In intestine, a few epithelial cells of the villi showed necrosis and sloughing. Microscopical examination of muscle could not be attempted. As no specific lesion could be detected and the animal died within few days in captivity, the light coloured muscles indicated that the animal died due to stress of captivity probably associated with capture myopathy. No bacteria and fungus was found from the collected tissue samples.

Discussion

Death due to traumatic injury in non-human primate was recorded by Rathore & Khera (1981) and Goswami (1994). In the present study death due to traumatic injury was comparatively very less than reported by Goswami (1994) where the cause of death were classified as infighting between intraspecies and interspecies, cage injury and death due to capture injury. But in this study no any cage injury and capture injury was recorded. It might be due to proper male and female ratio in the enclosures of the zoo. Chemical immobilizations for restraint might have been a factor in decreasing the number of deaths due to capture injury.

Prenatal stress significantly reduced birthweight, but did not shorten gestation durations, although all birthweights were within the range of what is considered normal for rhesus monkeys (Schneider & Moore, 2000). Prenatal stress was also associated with a neurobehavioural profile that included reduced neonatal attention, motor maturity and motor activity (Schneider, 1992; Schneider *et al.* 1992; Schneider & Coe, 1993). When exposed to stressful events, prenatally stressed monkeys showed more disturbance behaviour and higher levels of stress hormones, compared to controls (Clarke & Schneider, 1993; Clarke & Schneider, 1997). In the present case, as no significant lesions could be recorded at post mortem examination and different test could not confirm the cause of death, it was assumed that the slow loris died due to stress associated with capture myopathy. Similar conditions were recorded earlier in captive non-human primates (Goswami, 1994) and in captive herbivores (Chakraborty, 1991). During capture of wild animals, physical, environmental and psychological factors affect the animal simultaneously and the effects were accumulative (Sprakar, 1991). The present finding endorsed the view of Sprakar (1991).

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