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SOME HEALTH PROBLEMS ENCOUNTERED IN CAPTIVE AND SEMI-CAPTIVE RHINOCEROS

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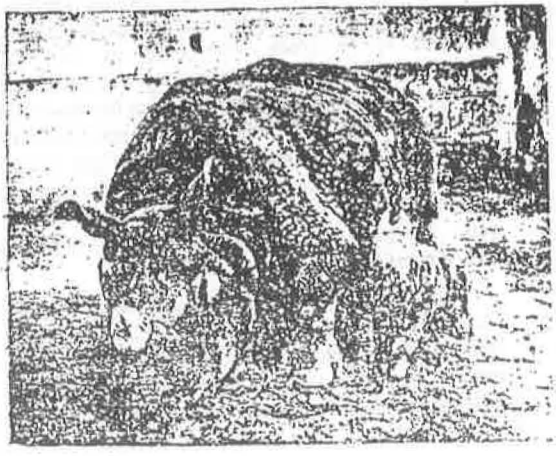
A perusal of the available literature reveals that losses among great Indian one horned rhinoceros *(Rhinoceros unicornis)* by catastrophies like diseases and injuries have occasionally been encountered in captive and free life. The infrequent reporting perhaps may be due to their 1) extremely low population as compared to other wild herbivores and 2) peculiar habit of remaining in irregular and discontinuous contact with other wild animals and with their own kind.

The present paper describes some of the fatal conditions recorded during our regular consultancy offered to various national wildlife reserves in the matter of health care, management and disease investigation.

Materials and Methods

This study accounts for mortality in 8 rhinos. These included 6 rhinos on display in captivity (zoos) and 2 out of 5 rhinos transported from the wildlife sanctuary, Assam to Dudwa National Park, Uttar Pradesh, under the reintroduction scheme of the Government. Cases have been described in respect to their clinical history and subsequent observations.



A Female Indian Rhino after giving birth

History and Observations

Case Study I :—During August, 1983, at Nehru Zoological Park, Hyderabad three rhinos fell sick and died after ailing for a period of 8-10 days. The clinical signs were weakness of hind limbs, shivering, grinding of teeth, nasal and occular discharges, anorexia followed by recumbency. During the illness body temperature ranged between 36.5°C and respiration rate 17 to 50 per minute. Dehydration was obvious in the terminal stages.

Animals were administered broad spectrum antibiotics, vitamins, corticosteroids, electrolytes and saline both orally and peritonialy but to no avail. Clinically the disease was suspected to be viral in nature. The postmortem examination was conducted. The small intestines showed marked haemorrhages and a great many tapeworms. A small abscess in the lung was present in a male rhino. Studies on virological isolation, pathological and blood examinations were carried out at IVRI, Izatnagar. The specimens were also processed simultaneously by Veterinary Biological Research Institute (VBRI) and Veterinary College Hyderabad.

Case Study II :—The Prince of Wales Zoological Garden, Lucknow maintained a pair of rhinos (7 year old male and 8 year old female). The female rhino fell sick on 13th December, 1983 and died after an illness of 6 days. The clinical signs were anorexia, restlessness, frothy salivation, tendency to bite her mate and other objects, staggering gait, paralysis of lower jaw and dashing of head against enclosure. On the morning of the 19th she was found dead. Clinically the case was diagnosed as rabies. Except for frothy exudate in the trachea and bronchi and severe congestion of meninges no other gross pathological changes were recorded. Brain specimens were collected in 50% buffered glycerine saline solution

for biological tests (mice inoculation) and in 10% formalin for histopathological examination. Soon after the death of the female, the remaining male rhino was immunized against rabies with 14 × 30 ml. dose of B. P. L. inactivated anti-rabic vaccine. But after about 1 year, the animal developed clinical manifestations similar to its female partner and met the same fate. The course of illness in this case was however, about 3 days. Clinically rabies was suspected. Only brain specimens were collected and processed for rabies diagnosis.

Case Study III :—On 31st March 1984, five rhinos were reintroduced to Dudwa National Park. They were kept in temporary stockades in the park. One of the females soon after arrival had a miscarriage. The animal had developed deep wounds and abscesses on many parts of the body, due to injuries. Later on the vagina was found swollen with putrid discharge. The animal went off feed, became dull and depressed. Her body temperature ranged between 96.2 to 100°F. Pulse and respiration rates were 40 and 10 per minute respectively. The animal did not respond to treatment and died on 12th April, 1984. The necropsy was performed 24 hours later. The gross pathological changes were recorded and specimens submitted for laboratory investigations. The remaining 4 rhinos were released into different areas of the park.

Case Study IV :—On 6th May, 1984, a female out of 4 rhinos released at Dudwa, National Park, was found limping on its forelimb. A deep wound on its croup infested with maggots was being picked by crows. For thorough clinical examination and treatment, she was tranquillized using M-99 (immobilon) on 7th May, 1984. After the needful drug was administered [fevivon (M 50-50)] the cow got up and walked a few steps but fell down on her right side. Repeated efforts to stand were not successful. It was noticed that right forelimb was unable to support weight and was being held in flexion, though the initial trouble was limping on left forelimb. It appeared that the animal had sustained contusion of shoulder joint and/or radial nerve compression and was treated. All the vital reactions of the animal, however, remained normal.

Some improvement was seen on the second day of treatment. The animal frequently tried to get up and at times attempted to step forward by the 5th day of treatment, but further improvement did not take place and subsequently she preferred to remain recumbent. The animal maintained her appetite. She ate food and drank water normally. The possibility of fracture in the limbs, however, was ruled out. Occasional passive extension and flexion of the limbs were advised, besides the symptomatic treatment.

On 26th May, 1984 besides the problem in right limb, a diffuse swelling on antero-lateral aspect of the left carpal joint developed. It was explored on 28th May. The exploratory puncture revealed only fresh blood. It was topically dressed with iodine solution. Prolonged recumbency led to development of bed sores on prominences which were treated. An interesting point of observation was that even in this state the animal was still making efforts to be on her legs, but to no avail.

An expert attributed the ailment due to deep injury (internal), fracture or nerve paralysis. However, prior to these suggestions, the animal was already under our treatment for radial nerve compression and/or paralysis.

The animal's condition was reassessed on 18th June. Although the vital reactions of the animal (temperature, pulse and respiration) were found to be within normal range, she still appeared to be weaker physically. There was evidence of gradual emaciation, reduction in size and atrophy of the affected right forelimb. She was reluctant to rise even on being provoked. The left forelimb revealed hard swellings covering the forearm and the knee joint. The movement of the joint was found to be restricted. About 60–70 ml. of blood ringed synovial fluid was drawn for culture. In the absence of visible improvement in the condition, the administration of life supporting drugs was advised. Re-examination in July showed that the animal's condition had further deteriorated and progonosie appeared to be grave. She died on 31–7–84, following an illness of 85 days. The complete right forelimb was cut and removed from the body and the left forelimb was sawed from just above the carpal joint. On the medial aspect of right scapula a large blackish coagulated necrotic mass around the auxiliary nerve was observed. Both the legs were X-rayed and then dissected to find out involvement of any bone or joint.

Case Study V :—A female rhino of about 50 years being maintained at National Zoological Park, Delhi died on 10th November 1984. There was no medical complaint except that the cow was physically weak, disprited and less vigorous. Signs of

senility such as wearing of teeth, skin discolouration and thinning of tubercles, folds and leg musculatures, etc., were obvious. She was maintaining interest in taking food and water. To prolong her life, tonics were being administered orally till death. A necropsy was conducted. Except a tumorous mass of about 2 Kg in the uterus, no other abnormality was recorded. A piece from the mass was cut and subjected to histopathological study. Blood smears were also prepared and stained with Giemsa and Gram's methods.

Results and Discussion

Case Study I : Viral infection could not be detected in any of the three rhinos which died at Hyderabad Zoo. A massive load of *Anoplocephala* tapeworms was encountered in two cases. This infection is commonly recorded in captive as well as in free rhinos (Jones, 1979).

A pulmonary abscess noticed in one male rhino was found to be tuberculous in nature. Mycobacterium acid-fast organisms have been demonstrated from pulmonary and pleural abscesses in rhinoceroses (Keep and Basson, 1973). The present cases yielded *Salmonella sp.* from intestinal contents (Sabir Ali, per. comm). According to the available literature, *Salmonella* infections have been reported on a number of occasions in both non-fatal (Williamson *et al.*, 1973 ; Jones, 1979 ; Clausen and Ashford, 1980) and fatal cases (Silberman and Fultan, 1979 ; Windsor and Ashford, 1972 ; Shmidt and Hartfiel, 1976). The isolation of *Salmonella* coupled with the occurrence of acute haemorragic enteritis indicated that the animals might have succumbed to this infection.

Case Study II : The presence of Negri bodies mostly in the Purkinje cells of cerebellum were detected in this female animal that died at Lucknow Zoo. Mice inoculated intracerebally with brain suspension started succumbing from 5th day post inoculation showing typical paralytic symptoms and the impression smears from their brain stained with Seller's stain revealed the presence of Negri bodies. The clinical symptoms, pathological and biological findings proved it to be a typical case of rabies. The epidemiological investigation carried out pointed to the possibility of the animal having been infected through contact with a rabid dog (Mukherjee *et al.*, 1984). Purkinje cells of the cerebellum and neurons of cerebrum and medulla showed marked degeneration. Mild perivascular cuffing was noticed in the sections of spinal cord but the biological test proved to be negative in case of male rhino.

Case Study III : The aborted cow developed septicmetritis and died due to pyaemic toxaemia. The cause of miscarriage apparently was prolonged transportation stress.

Case Study IV : Animal revealed fracture of the 8th right rib and atrophy of the muscles of the right limb. The muscular atrophy resulted due to radial paralysis following trauma at the axilla and damage to the nerve fibres. Cases of transient and permanent radial paralysis in black rhinoceroses immobilized and down on one side for 5.8 to 17.6 hours have beed recorded by King (1965). The present case essentially met the same fate after being tranquillized using M 99. Skin of the elbow of this limb had a hard mass of tissue at the base of decubitus ulers. Medical aspects of radius showed small area of bone erosion. *Staphyiccoccus aureus* was isolated from the synovial fluid of the left carpal joint. Osteoarthritis on X-ray examination and fracture of the radial and intermediate carpal bones of this joint were noticed, which have occurred as a result of some trauma (Hamerton, 1939).

Case Study V : The animal under study died at the age of about 50 years. Based on the signs of senility and history of a relatively long period of captivity, death was attributed to its old age. Earlier the maximum life span of 47 years in a rhino at Zoological Garden, Calcutta has been recorded (Sanyal, 1892). The hard tissue mass in the uterus was diagnosed to be fibroma.

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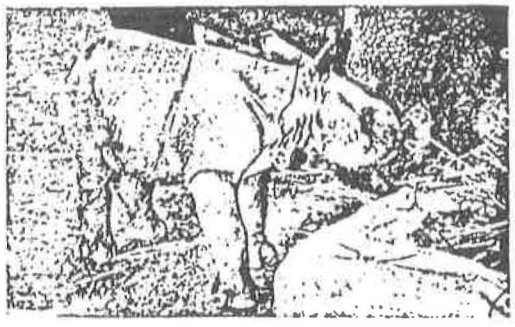

A Captive born Indian Rhino calf

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