

USE OF ANTIANDROGEN IN CONTROLLING MUSTH IN CAPTIVE ELEPHANTS

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Adult male Asian elephants and both sexes of African elephants manifest annually a physiological and behavioural phenomenon known as musth. This condition is characterised by enlargement of temporal glands with copious flow of secretion and aggressive episodes. The main manifestations are spreading of ears, alertness, fully opened ogling eyes with roving eye balls, stiff and tense body, extended blowing trunk and a charging or destructing tendency towards human beings especially mahouts. This condition is mostly seen during winter season and the elephant is to be tethered safely by putting chains on both front and hind legs. The symptoms and behavioural changes of musth usually last for one to three months or some time up to five months and their intensity varies in pre-musth, violent musth and post-musth phases. (Jainudeen *et al.* 1971 and Chandrasekharan *et al.* 1989). The androgen level in the blood usually increases considerably during the period of musth and it is stated to be the reason for the increased aggressive behaviour in musth elephants (Jainudeen *et al.* 1972; Rasmussen *et al.* 1984; Cooper *et al.* 1990 and Niemuller and Liptrap, 1991). Whereas Flanagan and Flanagan (1983) observed reduction in aggressiveness in castrated bull elephant. Based on these hypotheses, a trial with the oral administration of an antiandrogen, a sedative and diuretic was undertaken in elephants under pre-musth and in the last phase of violent musth in order to make them more tractable and can be put to use and the results are furnished in this paper.

MATERIALS AND METHOD

During the present study 22 captive elephants showing different phases of musth, maintained by private individuals and Devaswoms in different parts of Kerala were selected. The age of the elephants varied from 25 to 65 years. Nineteen elephants were in the pre-musth phase showing reluctance to obey the commands of mahouts, slight engorgement of temporal glands with small quantity of discharge at the temporal opening, enlargement at the phase of violent musth showed slight regression of the temporal glands with flowing discharge, dribbling urination and charging tendency against mahouts. Flutamide (Drogenil 250mg tab, Fulford (India) Ltd., Bombay) is a potent non-steroidal antiandrogen, haloperidol (Serenace 10mg tab, Searle (India) Ltd., Bombay) a sedative and potassium iodide a diuretic were powdered, concealed with in jaggery bolus and administered orally to each elephant. Flutamide @ 2500 mg., 5000mg and 7500mg was administered to five, ten and four elephants respectively during their pre-musth phase and @ 5000mg to three elephants in the last phase of musth once daily for continuously three days. Haloperidol @ 100mg and Pot. iodide @ 20gm per animal per day were also administered to all the 22 elephants.

The change in the behaviour and other symptoms of musth were observed for a period of two months and all the elephants were fed with sufficient quantity of palm leaves and water. The elephants in pre-musth phase were engaged for usual work but the elephants in the last phase of musth were under full restraints with chain on both hind and front legs.

RESULTS AND DISCUSSION

Elephants in pre-musth :

The enlargement of temporal glands, tendency to masturbate, swelling at the base of the penis have reduced considerably in two elephants from three days onwards following administration of flutamide @ 2500 mg/animal. All these two elephants came into musth after 30 days and lasted for three months but with reduced aggressiveness. Other three elephants started showing musth symptoms on the 15th, 20th and 25th day following the treatment with all its characteristic musth symptoms.

Out of the ten elephants received flutamide @ 5000mg, seven elephants showed reduced musth symptoms from the second day onwards and came into musth after 45 to 60 days and lasted for two to three months with less aggressiveness. Other three elephants in the group failed to show musth symptoms during the stipulated period but came into musth as usual during subsequent season.

All the four elephants dosed with flutamide @ 7500mg did not show musth symptoms in the stipulated time and were normal in behaviour. They came into musth in next season as usual.

Elephants in the last phase of musth :

All the three elephants, administered flutamide @ 5000mg started to show reduction of all the musth symptoms from the second day onwards and became normal in behaviour and activities. They were released from the tethering site on the 5th, 7th and 10th day and were used for routine festival parade and work.

Flutamide was absorbed rapidly after administration and gets converted into 2-hydroxy flutamide before action (Neri, 1976). It was found to cause regression of androgen target tissues such as prostate and seminal-vesicle in rats (Marchetti and Labrie, 1988 and Chandolia *et al.* 1991) and improvement in clinical symptoms in prostate cancer patients (Aso *et al.*, 1993) by binding the androgen receptors and thereby blocking the androgenic action (Sogani *et al.* 1975 and Beland *et al.* 1990).

During the present study the reduction in the aggressive behaviour and other musth symptoms observed in the treated elephants may be due to the reduction in the concentration of testosterone level in the blood. This also supports the observations of Jainudeen *et al.* (1972), Rasmussen *et al.* (1984), Cooper *et al.* (1990) and Niemuller and Liptrap (1991) in respect of the aggressiveness and high level of testosterone during musth in elephants. It also confirms the finding of Flanagan and Flanagan (1983) of reduced aggressiveness observed in a castrated bull elephant. The initial daily dose of flutamide @ 2500mg/elephant is not found to be sufficient to

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reduce aggressive behaviour in pre-musth phase. The drug is well tolerated and does not prevent the occurrence of musth during the subsequent seasons.

SUMMARY

A combination of flutamide @ 5000mg and 7500mg, haloperidole @ 100mg and Potassium iodide @ 20 gm per elephant administered orally once in daily for a continuous period of three days is found to be very effective in controlling aggressive behaviour and other musth symptoms in captive elephants during their pre-musth and in the last phase of violent musth. The drugs are well tolerated.

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RESEARCH NOTE

Use of an Indigenous Product "Resant" for Wounds in Elephants

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"Resant" (Respel Pharma) is an indigenous product containing Sarvatobadra, Naktamala, Sharshapah, Tamratuttu, Bhuchanaka and Processed in Sindhu Varam, Waidehi, Peetadaru, Ksharapatra, Bhanguira, Mukhmal Pushpa and Sudda. As an ointment it has been recommended as antiseptic and parasitocidal for treatment in animals. The ointment was used in 75 cases in elephants for treatment of abscesses, sinuses, superficial wounds and in decay of the root of tusks. In abscesses after opening it and in sinuses, the cavity or inflammatory tract, was cleaned with hydrogen peroxide, mopped dry and the ointment was applied impregnated in surgical gauze. Chronic inflammatory tracts and abscesses were cauterised with triple sulphur and after removal of necrotic core, Resant was applied. In wounds which were superficial, after cleaning with antiseptics, the drug was applied. In the alveoli of the tusk and in cases of decay of dental pulp of the tusk, the cavity was cleaned with hydrogen peroxide, mopped dry and the ointment was applied. With the use of Resant, it was observed that there was considerable reduction in suppurative reaction and the necrotic tissue was separated within 48-72 hours. Granulation tissue was noticed in 5-7 days time and the healing of wounds was uneventful. The ointment also possessed satisfactory fly repellent property.