Microfilariae recurrence in graded murrah buffalo treated with repeated doses of ivermectin

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Abstract Filariasis is one of the common parasitic diseases of animals and man caused by a small group of filarid nematodes throughout the world. This disease is highly prevalent in hot and humid arenas of India especially hilly parts of Tarai region of Uttar Pradesh and coastal areas of Andhra Pradesh, (Kumar et al. 2005). Microfilariasis is manifested by pyrexia, loss of appetite, reduced milk yield, weakness, edema of dependent parts. Macrofilaricidal and micerfilaricidal are the most effective drugs to get rid of the larvae and adult worm burden. Ivermectin 200 µg/kg body wt subcutaneous route is used as a curative drug in present clinical case and animal was responded well with the treatment. After 2 months the animal brought with same symptoms which were reported earlier. Wet blood film examination revealed recurrence of microfilariae in the peripheral blood circulation.

Keywords Microfilaria · Ivermectin · Microfilaricidal

Clinical case study

A female graded murrah buffalo was presented to the veterinary hospital in Pamarru Mandal of Krishna district with a history of weakness, depression, and reduced milk yield in early stages of lactation (2 weeks post parturition).

The animal appears to be dull, depressed with signs of edema in limbs. Slight rise in temperature without any changes in pulse and respiration rate were noticed.

Results

A detailed clinical investigation was conducted with coproscopy and no parasitic ova could be detected. Wet film examination from peripheral blood, microscopic examination of giemsa stained blood smears and Knott's concentration smear revealed microfilaria. Then the animal was treated with ivermectin 200 µg per kg body weight subcutaneous route. Animal was responded well with treatment. After 2 days it start increases feed intake, exhibit normal body temperature and edema of the dependent parts disappeared.

After 2 months the animal brought with same symptoms which were reported earlier like high temperature with edema of dependent parts. Wet blood film examination revealed microfilariae in the peripheral blood circulation. During this phase animal was treated with two doses of ivermectin 200 µg per kg body weight subcutaneously route with 1 week interval.

Discussion

Ivermectin is a macrolid antibiotic, is a semi synthetic derivative of avermectin (Tripathi et al. 2006). It can be used in treatment of many filarial infection of humans viz onchocercosis and loaosis and it has only microfilaricidal action but not on macrofilaricide. The antiparasitic mechanism of ivermectin is through selective and high affinity binding of the drug to the glutamate gated chloride ion

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Fig. 1 Knott's technique—microfilariae

Fig. 2 Giemsa stained blood smear (100x)—microfilariae

channels in invertebrate nerve and muscle cells. It increases the permeability of the cell membrane to chloride ions, resulting in hyperpolarization of nerve or muscle cells, causing paralysis and death of the parasite. The drug is also observed to effect other ligand gated chloride channels, particularly those gated by gamma-amino butyric acid (Kumar and Joshi 1993).

Microfilariosis is treated in cattle and buffaloes successfully by several drugs, namely, Anthiomaline, Levamisole and Diethyl carbamazine citrate. But good results have been obtained with subcutaneous administration of single dose of ivermectin at a dose rate of 200 µg/kg body weight (Bhaskara Rao et al. 2003; Binosundar et al. 2003).

Fig. 3 Murrah buffalo showing edema in forelimb and hind limbs

However, it is still not certain why ivermectin shows activity only against microfilaria and but not on adult worms (Campbell 1991). It is confirmed in loaosis patients with ultrasonography that, the adult worms are not killed even at total doses of 4,800 µg/kg bodyweight over a period of 6 months (Dreyer et al. 1996).

In the present study the recurrence of microfilariae in the peripheral circulation after 2 months may be due to it is microfilaricidal but not effective against adult filarial worms. Hence there is recurrence of infection (Figs. 1, 2, 3).

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