Dirofilarioses in dogs & humans in Kerala

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There has been an increased occurrence of filarial worms in the subcutaneous tissues and subconjunctival space of human beings belonging to different areas of the state of Kerala. The present work was carried out to identify the worms recovered from human cases, to study the presence of microfilariae in dogs and to discuss the possible mode of infection in human beings. Twelve worm specimens from human patients received in the Department of Veterinary Parasitology, College of Veterinary and Animal Sciences, Mannuthy from 2002 to 2004 were identified as Dirofilaria repens based on morphology. Out of the 160 blood smears of dogs examined during the same period, microfilariae were detected in 11 samples (7%). With 7 per cent dogs positive for microfilariae of D. repens in Kerala, it is suggested that human beings are at an enhanced risk of acquiring dirofilaria infection.

Key words Dirofilaria repens - dogs - humans - Kerala

The genus Dirofilaria includes various species that are natural parasites of dogs, cats, foxes and wild mammals. Dirofilaria immitis is the species occurring in the right ventricle and pulmonary artery of the dogs. The worm commonly known as dog heart worm, is widely dispersed and found in the tropics, subtropics and temperate zones. Another naturally occurring species commonly encountered in the subcutaneous tissues of dogs is Dirofilaria repens which has also been reported from different parts of the world. Mosquitoes belonging to the genera of Culex, Aedes, Armigeres and Anopheles have been incriminated as suitable vectors for this parasite, which take up the microfilaria (mf-L1) while feeding on an infected host. In the mosquitoes, the mf develops to the infective 3rd stage larva (L3) in the Malpighian tubules, and then migrates to the proboscis through the body cavity. Transmission takes place when a potential vector bites dogs or other hosts during a subsequent blood meal.

The incidence of microfilariosis in dogs by examination of the peripheral blood was found to be 13.04 per cent in Calicut and 24.2 per cent in Thrissur. No specific staining procedure was adopted to identify the species involved. In a later study conducted in dogs at Ernakulam and Thrissur districts for a period of one year, the prevalence of microfilariosis was 7.59 per cent where histochemical staining method was employed to identify the species involved as D. repens. About 782 cases of D. repens infection in humans have been reported worldwide. The worms have been detected in the subcutaneous tissues of the body or in the subconjunctival space. The first report on human dirofilariosis from the state of Kerala was from a woman in Ottappalam in Palakkad district in 1999. We undertook this study to identify the worm specimens recovered from human beings from different parts of Kerala and also to estimate the prevalence of microfilariosis in dogs in Thrissur.
Twelve worm specimens received in the Department of Veterinary Parasitology, College of Veterinary and Animal Sciences, Mannuthy for identification from various hospitals in six districts of Kerala and one from Aravind Eye Hospital, Coimbatore during a period of two years (June 2002 to May 2004) from human cases were examined in detail. The worms were intact and preserved in 70 per cent alcohol or 10 per cent formaldehyde. The specimens were measured and later cleared in lactophenol and the species was identified based on morphology\textsuperscript{10,11}. A total of 160 blood smears collected from dogs brought to the Veterinary hospitals attached to the College of Veterinary & Animal Sciences during the same period revealed the presence of mf in 11 samples giving the percentage of infection as seven.

The worms obtained in all cases were females except one. The female worms measured 9 to 13.5 cm in length while the single male worm was 6 cm long. The maximum width of the worms ranged from 300 to 614µ. Of the 12 worms recovered, nine were from eye and three from subcutaneous tissues. All the female worms identified had well developed uteri laden with eggs. The relatively longer worms had eggs with larvae within them. The worms were identified as \textit{D. repens}. In all the 12 human cases, worms were detected when they were found to cause nodules/abscesses in the subcutaneous tissues or subconjunctival space. The presence of mf in the peripheral blood has not been reported from any of these patients. Microfilariae need not be present always since the worms would not have attained full size, as man is not a natural host. Absence of a male worm in the same host can make a female worm nonpotent. It is not uncommon for the female worms to reach a length of up to 18 cm in the natural host. Such animals usually have mf in the blood. It is worth mentioning that in all the cases only single worms could be recovered from each patient.

Diagnosis of \textit{Dirofilaria} infection in human beings remains difficult as symptoms exhibited by the patient are varying and nonspecific depending upon the location of the worm. The symptoms, which signal their presence in human beings, include transitory inflammatory swellings or nodules that may or may not be painful. When living worms enter the conjunctiva, they may cause acute symptoms and the affected individual then seeks medical attention\textsuperscript{12}. It should be noted that the $L_3$ of the size of about one mm requires 6 to 8 months to develop to the adult size of 10 cm or more. Hence, the migration of the worm through sensitive tissues especially in the head region could lead to tremendous irritation and inflammation as in patients from whom worms have been recovered from the subconjunctival space. Similarly, gradual development of the worm to a nodule or abscess in the subcutaneous tissue has also been reported to be painful.

Based on the present observations it may be concluded that dirofilariosis in humans due to \textit{D. repens} infection is a fast emerging zoonosis in Kerala. When the prevalence of infection in domestic dogs has been estimated to range from 7 to 24 per cent, it would definitely be much more in stray dogs. With the presence of microfilariae infection in 7 per cent dogs and the abundance of mosquitoes in all localities in Kerala, an enhanced rate of infection can be anticipated in human beings.

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\textbf{References}


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