Original Article

INCREASING CASES OF DIROFILARIASIS IN KERALA – AN EMERGING PUBLIC HEALTH CONCERN

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ABSTRACT

Background: Dirofilariasis is a vector-borne parasitic infection, caused mainly by *Dirofilaria* nematodes, namely, *Dirofilaria* (*Nochtiella*) *repens* and *D. immitis.* So far the known vectors are mosquito species of the genera *Anopheles*, *Aedes*, *Culex* and *Coquillettidia*. In India, majority of human dirofilarial cases have been reported from Kerala followed by Karnataka and

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Maharashtra, although sporadic cases have also been reported from Tamil Nadu, Orissa, Bihar, Haryana, Gujarat, Punjab and Assam. In Kerala, recently many cases were reported from Malappuram District. This called for immediate and effective measures to stall and control the disease, for which epidemiological surveillance, research and public intervention programmes were initiated involving medical entomologists, veterinary scientists, public health specialists and health workers. This communication is mainly intended to give brief information on human dirofilariasis as an emerging zoonotic disease in Kerala.

Keywords: Malappuram, *Dirofilaria repens*, zoonosis, dirofilariasis

INTRODUCTION

Dirofilariasis is an occasional zoonotic disease caused by a few of the mosquito transmitted nematodes belonging to the genus *Dirofilaria*. Among the *Dirofilaria* species, the most common affecting human is *Dirofilaria repens*[1]. Less frequently, other species such as *D.immitis*, *D.ursi*, *D.tenuis* and *D. striata* have also been reported afflicting human beings in different parts of the globe[2]. The natural host of *Dirofilaria* consists of pets and wild animals. Mosquito species of the genera *Anopheles*, *Aedes* and *Culex* are the primary vectors of *Dirofilaria* transmitting dirofilariasis among the host animals[3]. *Dirofilaria*-human affliction also happens inadvertently when the agent is transmitted, usually, from pet animals to human[4, 5]. Most often dirofilariasis is transmitted from pet dogs, in rare cases from cats, to human through the bite of vector mosquitoes.

In India, *D. repens* is the most common cause for dirofilariasis[2]. Among the affected areas in India, majority of the cases were reported from Kerala. The first case of human dirofilariasis in Kerala was reported in 1976[6]. Subsequently, nearly a hundred cases have been reported from across the state[7, 8,9,10].

MATERIALAS AND METHOD

A total of four cases of ocular *dirofilariasis* were treated at TreeG Eyecare Hospital, Manjeri, Malappuram district (75° E -77° E longitude and 10° N -12° N latitude), Kerala from June 2019 to May 2020. All the patients were from Malappuram district, Kerala. The patients had excruciating pain in the affected eye. Dr. Haroon, Consultant Ophthalmologist (Corresponding author) of TreeG Eyecare Hospital, Manjeri, Malappuram through slit lamp examination detected live worm under the sub conjunctival space. The patients were given local anesthesia and then under aseptic precautions the conjunctiva was incised to explore the sub conjunctival space. The worm persisted in the sub conjuntival space was surgically removed. The clinical details of the cases were retrieved from the case files of the hospital. The worms were sent for histopathological and molecular studies for the identification and other characteristics of the worm. The details of all the four cases are presented in this paper.

OBSERVATIONS AND RESULTS

The first case of dirofilariasis was an elderly woman aged 68 years who came to the hospital with severe eye pain on 20.06.2019. The second case was also a female patient of 69 years of age, hailing from Morayyur, Malappuram. She came for consultation on 21.09.2019 with pain in the eye. The third case was a young lady of 31 years from Thiruvalla, Malappuram. She came on 16.05.2020 with severe pain in the eye. The fourth case was a male patient aged 73 years from Kodur, Malappuram who came to the hospital on 29.05.2020 with same symptoms as in the other cases. The ophthalmologist, through slit lamp examination detected the presence of worm in the sub conjunctival space in all the above four cases. The worms were alive and wriggling which caused excruciating pain in the eye of the patients. The worms were surgically removed from the eyes of the patients and subsequently they were relieved of the pain. Prophylactic administration of diethyl carbamazine (DEC) was also administered to the patient and their family members. The report was sent to the district medical officer of (health), Malappuram district and local veterinary hospital for follow up and further necessary action. Histopathological examination and molecular studies revealed that the worms were *D. repens*. The details of the patients and worms are furnished in Table.1.

Table 1. Cases of *Dirofilaria* reported in Malappuram district with epidemiological details

Case No.	Location of the worm	Age of patient	Sex of patient	No. of worm	Sex of worm	Length of worm	Species of worm
1	Sub conjunctival space	68	F	1	F	15.0	*D.repens*
2	Sub conjunctival space	69	F	1	F	6.0	*D.repens*
3	Sub conjunctival space	31	F	1	F	6.0	*D.repens*
4	Sub conjunctival space	73	F	1	F	6.0	*D.repens*

An investigation team visited all the patients' houses and the neighbourhood areas. On examination of the premises of the houses, several breeding sources of *Aedes* mosquitoes, the vectors of *D. repens,* were found. The predominant species of mosquito was found to be *Aedes albopictus* which is a vector of dirofilariasis. This indicated that the *Dirofilaria* worm might have been transmitted from the natural host i.e. dogs, either stray or domestic, to the affected patients through the bite of *Aedes* mosquitoes that were breeding abundantly in the area. The increasing incidence of dirofilariasis in Kerala is of considerable concern due to many host and environment factors. The host factors include the abundance of stray dogs waywardly thriving everywhere in Kerala. A number of studies have reported about dog's harboring *D. repens* from various parts of Kerala[8,11,12,13]. It is also of concern that effective and widespread prophylactic measures have not been planned or implemented as part of public health intervention programs by government or other agencies, except localized mosquito control activities and drug administration to dogs and human by some local bodies. Measures to build public awareness against this disease are also lacking. Over the last few years, the number of cases has significantly burgeoned.

CONCLUSION

Human dirofilariasis is an emerging zoonotic disease in India. Among the human *dirofilaria* cases reported in India, majority are from Kerala. This indicates that this illness is an emerging public health concern in the State. The current situation warrants urgent initiation of operational research, development and implementation of innovative action programmes and institution of effective epidemiological monitoring system. For any vector-borne disease where animal species serve as reservoirs, the veterinarians and vector control programme have a prominent role in preventing the disease. Role of different vector species and their vector competence/vectorial capacity is a matter of further research.

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