

The Lethal Cardiac Invader: *Dirofilaria immitis*

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ABSTRACT

In this article will talk about *Dirofilaria (D.) immitis* locally known as the heartworm. It is a roundworm that primarily affects dogs, cats, and sometimes humans. Once inside a feline or canine, this roundworm lives in the right side of the heart, and pulmonary artery. They interfere with the circulatory system of the animal, the health of the animal, and the overall health of the host. In this extension article, we'll be looking at the life cycle of *D. immitis*, its effects on its hosts, how it spreads, how it causes disease, and how it can be prevented in animals.

Introduction:

Dirofilaria (D.) immitis is a roundworm commonly known as the "heartworm" due to its primary infection site being the heart. In animals, it causes the disease "Dirofilaria," clinically, this disease is characterized by anemia, coughing, exercise intolerance, lethargy, malnutrition, and weight loss. This is primarily due to the heartworm feeding on the host's blood. Furthermore, its presence inside the heart also affects how the heart's chambers fill and deliver blood to the body, decreasing the overall cardiac output of animals. Consequently, this decreased cardiac output can cause the heart to work harder and, over time, can lead to congestive heart failure.

The life cycle of the "Heartworm"

Dirofilaria's life cycle is composed of 5 larval stages, which consist of L1 through L5. Adult worms live inside various heart parts, mostly the coronary artery. These adult worms mate, and after mating, females release L1 into the heart; the heart pumps blood and carries these larvae with it. Following this, mosquitoes feed on host blood and through this, they ingest microfilariae (L1); inside the mosquito, the larvae go from L1 to L2 to L3. However, turning into L3 is temperature-dependent in the sense if the environment temperature is not right, there will be no development into the L3 stage; the suitable temperature is around 14°C. L3 is the infective stage; whenever this mosquito bites a new animal, it will transmit the L3 larvae into them. Once inside the new host, L3 molts into L4 inside the subcutaneous tissue, adipose, or muscular tissues after 1-10 days of infection. From there, L4 enters the vascular system, migrating to the pulmonary arteries and heart; over here, they will develop into adult form over the next 100 to 152 days (1, 2).

Silent threat to the pets' health

The primary complication arises from the adult form as these adults reside in the heart of the host, the pulmonary arteries to be specific, which leads to pulmonary hypertension, which is a cause of congestive heart failure. Another complication that arises is the cardiac output and outflow of blood are affected due to adult worms occupying space in the heart chambers, not allowing for complete filling of atriums and ventricles. This all puts more stress on the heart and makes it work harder. Furthermore, adult worms can also cause damage to the arteries, causing them to become thickened. In addition to the mentioned complications, the host's health is drastically affected as these worms feed on blood, resulting in anemia, exercise intolerance, decreased performance, weight loss, and lethargy (3, 4, 5).

Treatment and Prevention

D. immitis can be prevented by providing a hygienic environment to prevent mosquitoes from swarming up; electrical killers or insecticides can also be used to control the mosquito population area. Furthermore, regular vet visits to ensure health is of top-level and regular deworming medications such as Ivermectin, Moxidectin, and Selamectin. These are the most effective medications used as Ivermectin is effective up to 87-93%, Moxidectin showed 100% effectiveness, lastly Solemectin also showed 100%. By doing the following, we can prevent the heart form from occurring, or if an infestation is already present, it may be stopped from progressing (6, 7).

In conclusion, *D. immitis* is a roundworm that resides inside the heart, affecting the overall health and performance of an animal. Common signs seen by owners include lack of energy, weight loss, and exercise intolerance. It is primarily spread through mosquitos as they are the intermediate hosts and the parasite spreads through them. Therefore, by controlling the mosquito population and by having regular veterinarian checkups, we can prevent Dirofilaria from happening or prevent its progression.

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