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HEARTWORM DISEASE: A DANGER FOR OUR PETS AND POTENTIAL IMPLICATIONS FOR HUMANS (ДИРОФІЛЯРІОЗ: НЕБЕЗПЕКА ДЛЯ НАШИХ ДОМАШНІХ ТВАРИН І ПОТЕНЦІЙНІ НАСЛІДКИ ДЛЯ ЛЮДЕЙ)

У публікації проведено опис небезпечної хвороби тварин та людей . Було проаналізовано епідеміологію, передачу, патогенез та клінічні прояви дирофіляріозу у різних тварин.

Ключові слова: *інфекція, паразитарне захворювання, личинка, господарь, здоров'я, серцево-судинна система, симптоми, клінічні ознаки, профілактичні заходи, препарати.*

The publication describes a dangerous disease of animals and humans. The epidemiology, transmission, pathogenesis and clinical manifestations of heartworm disease in various animals were analyzed.

Keywords: *infection, parasitic disease, larva, host, health, cardiovascular system, symptoms, clinical signs, preventive measures, drugs.*

Heartworm disease, caused by the parasite Dirofilaria immitis, is a serious and potentially life-threatening condition that primarily affects dogs and, to a lesser extent, cats. Although human infections are rare, the zoonotic potential of the parasite underscores the importance of understanding its transmission, pathogenesis, and prevention. This report provides an overview of heartworm disease, its epidemiology, clinical manifestations, and the measures necessary for effective prevention and treatment [1].

Heartworm disease is a parasitic infection transmitted by mosquitoes that carry infective larvae of Dirofilaria immitis. In dogs, the infection can progress from an asymptomatic stage to severe cardiovascular and pulmonary complications. Cats, although less frequently affected, often exhibit atypical and sometimes severe clinical signs. Humans can also become accidental hosts, although the infection does not progress in the same way as it does in animals. The increasing incidence in various regions highlights the need for comprehensive control and prevention strategies to protect both animal and public health [2].

The life cycle of Dirofilaria immitis is closely linked to the biology of its mosquito vectors. When a mosquito takes a blood meal from an infected animal, it ingests microfilariae, which then develop into infective larvae within the mosquito over a period of approximately 10 to 14 days. These infective larvae are subsequently transmitted to a new host when the mosquito feeds again. Environmental factors such as temperature and humidity significantly affect the rate of larval development, making heartworm disease more prevalent in regions with warm climates and abundant standing water, which serves as breeding grounds for mosquitoes. Changes in climate and urban development have contributed to the spread of the disease into areas that were previously considered low risk [1].

Dogs are the primary hosts for heartworm disease. Infected dogs may initially show no symptoms; however, as the worm burden increases, clinical signs begin to appear. Common symptoms include coughing, exercise intolerance, weight loss, and fatigue. In advanced stages, the accumulation of adult worms in the heart and pulmonary arteries can lead to pulmonary hypertension and right-sided heart failure. The progression of the disease is often gradual, which can delay diagnosis and treatment until significant damage has occurred [3].

While cats are less commonly infected than dogs, heartworm disease in felines is often more challenging to diagnose and manage. Cats usually harbor fewer worms, but even a small number can cause a pronounced inflammatory reaction in the lungs. This reaction may lead to a condition known

as Heartworm-Associated Respiratory Disease (HARD), which can mimic other respiratory conditions such as asthma. Due to the lower worm burden and the different pathophysiology in cats, clinical signs are often sudden and severe, sometimes resulting in rapid deterioration of health or even sudden death [1].

Human infections with Dirofilaria immitis are rare and typically occur when the larvae are deposited in the skin by a mosquito bite. In humans, the larvae do not develop into fully mature worms. Instead, they often become encapsulated within small pulmonary nodules that are usually asymptomatic and discovered incidentally during routine imaging examinations. Although the clinical significance in humans is minimal, these cases highlight the zoonotic potential of the parasite and the interconnected nature of human and animal health [2].

Prevention is the most effective strategy against heartworm disease. Year-round administration of heartworm preventive medications is strongly recommended for dogs. These preventive treatments, which are available in various forms (oral, topical, or injectable), target the early larval stages of the parasite before they mature into adult worms. In addition to chemoprophylaxis, reducing exposure to mosquito bites through environmental control is crucial. Measures such as eliminating standing water, using insect repellents, and ensuring proper screening in homes can significantly reduce the risk of infection [1].

Treatment of heartworm disease in infected animals is complex and can be risky. In dogs, the standard treatment involves the administration of adulticidal drugs that kill mature worms. However, the death of the worms can lead to an intense inflammatory response and the risk of thromboembolic events. As a result, strict exercise restriction and supportive care are required during the treatment process. In cats, treatment options are more limited, and the focus is primarily on managing clinical signs and preventing complications rather than on aggressive elimination of the parasite [3].

Controlling heartworm disease in pets also has public health benefits. By reducing the reservoir of infection in animal populations, the risk of accidental transmission to humans is minimized. An integrated approach that combines veterinary care, public education, and environmental management is essential for controlling the spread of heartworm disease and protecting both animal and human health [2].

Heartworm disease continues to be a significant threat to the health of our pets, with potentially fatal consequences if left untreated. The gradual progression of the disease in dogs and the unpredictable, often severe clinical manifestations in cats underscore the critical importance of early detection and consistent preventive measures. While the risk to human health is minimal, the occasional zoonotic case reinforces the necessity for integrated efforts in disease control. Ultimately, comprehensive prevention strategies—including regular veterinary care, effective prophylactic treatments, and environmental management—are essential for protecting the well-being of both animals and humans [1].

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