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An Exploration on Trematodes and cestodes in humans

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Abstract

Praziquantel usage for treating human trematode and cestode infections is briefly reviewed, along with status and new concerns. Numerous studies have shown the effective use of praziquantel in the management of the majority of human-infecting trematodes and cestodes since it was originally marketed as a broadspectrum anthelmintic in 1975. The following trematode and cestode disorders are among those that are targeted for treatment: schistosomiasis, clonorchiasis, opisthorchiasis, paragonimiasis, heterophyidiasis, echinostomiasis, fasciolopsiasis, neodiplostomiasis, gymnophalloidiasis, taeniases, diphyllobothria Praziquantel, however, is ineffective against Fasciola hepatica and Fasciola gigantica infections; thus, triclabendazole, a different medication, is required. Praziquantel also fails to effectively treat larval cestode infections, including hydatid disease and sparganosis. Praziquantel's exact mode of action is still not fully known. Along with allergic or hypersensitive responses to praziquantel treatment, there are also new issues with praziquantel therapy, such as the development of drug resistance in the treatment of Schistosoma mansoni and probably Schistosoma japonicum. Combining the usage of medications, such as praziquantel and other recently released substances like triclabendazole, artemisinins, and tribendimidine, is being tested as a means of coping with and resolving these issues.

Keywords: Praziquantel, Trematode, Cestode, Chemotherapy,

Introduction

The central or peripheral nervous system may get infected by cestodes, trematodes, and protozoa, which can result in a range of clinical symptoms and indications. With one exception, platyhelminthes, which include cestodes and trematodes, cannot survive without a host. All around the globe, platyhelminthes may infect the nervous system. Cestodes, sometimes known as "tapeworms," may be found in adult or larval stages. Cestodes are segmented worms with a ribbon-like form and an anterior scolex utilised for host attachment. Because adult forms seldom extend outside the gastrointestinal tract, larval forms are often more harmful to the human neurological system. This issue of Seminars in Neurology has an essay on neurocysticercosis, which may be the most widespread cause of epilepsy worldwide and is brought on by the cestode Taenia solium.

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Trematodes, often known as "flukes," may subsequently enter the neurological system after infecting the liver, lungs, gastrointestinal tract, or blood. All species save Schistosoma are hermaphrodites, meaning they can reproduce and survive within their hosts. Trematodes have two anterior suckers that allow for a secure bond with their host. Protozoans may either be free-living organisms or obligatory parasites, depending on how they move. The range of clinical symptoms and indications of protozoal infection is broad, and nervous system infection may happen independently of other system involvement. Protozoans are often simpler to recognise by straightforward light microscopy than other parasites because of their huge size.

Cestodes

Echinococcus (Hydatid Disease)

Epidemiology

Echinococcus granulosis and Echinococcus multilocularis are the two species that infect humans most often. 1 Cystic echinococcosis (cystic hydatid illness) is brought on by the endemic E. granulosis, which is found in the Mediterranean, the Middle East, and Latin America. Alveolar echinococcosis, also known as alveolar hydatid disease, is caused by E. multilocularis, which is about half as big as E. granulosis and native to Alaska, central Europe, Turkey, and China. 1 The main hosts are red and Arctic foxes, although domestic cats and dogs may also get the disease. According to epidemiological evidence, E. multilocularis may spread between dogs, foxes, and rodents. 3 Because they come into touch with diseased animals more often, females and children suffer disproportionately in endemic nations.

Pathophysiology

Dogs and other canids' digestive tracts are home to E. granulosis. Following ingestion by a canid, the parasite swiftly moves from the small intestine to the liver before passing via blood or lymphatic arteries and into the lung, brain, vertebrae, pericardium, kidney, or periorbital tissue. As intermediary hosts, man and sheep get sick when they consume eggs shed by infected animals. Hydatid cysts with scolices-rich serous fluid develop in humans as a consequence of infection.

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Solitary hydatid cysts develop in the liver as a consequence of most infections. While E. multilocularis may also spread by blood or lymphatic channels to other organs, it seldom affects organs other than the liver, unlike E. granulosis.

Trematodes

Paragonimus

Epidemiology

The only mammalian lung fluke that may infect people is Paragonimus spp. Globally, an estimated 20 million individuals are affected, with 10 million of them being in China. P. westermani, sometimes known as the "Oriental Lung Fluke," is indigenous to Western Africa and Asia and is the subspecies most frequently associated with human infection. Infection prevalence is somewhat greater in girls than in men, peaking in adolescence. The most frequent source of human Paragonimus spp. infection is freshwater crab or crayfish ingestion. Crabs and crayfish that have been fully cooked cannot spread disease, but many regional recipes that are pickled or marinated rather than fully cooked have the potential to do so. Other animals that may carry the fluke and spread sickness to people include domesticated cats, dogs, wild boars, and pigs.

Pathophysiology

Fluke metacercariae are discharged into the small intestine after the organism has been consumed. The larvae move through the peritoneum and intestinal wall during the course of 2 to 8 weeks in order to infiltrate the lung parenchyma. The larvae stay in the lungs until they reach adulthood, after which they migrate again. Worms in adulthood may live up to 20 years. Migration to the brain is challenging, and the method is unclear. According to some research, larvae move via the jugular vein's loose connective tissue before entering the posterior circulation through the skull base foramina. This notion is supported by the occipital and temporal lobes' propensity for infection.

Conclusion

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A safe, highly effective, and broad-spectrum anthelmintic, praziquantel treats trematode and cestode infections in both people and animals. The only infections in humans for which it cannot be used are fascioliasis, hydatid disease, and sparganosis; in each of these cases, triclabendazole, a medication made up of the antibiotics praziquantel and albendazole, and surgical removal of parasites, may be used instead. Emerging issues include praziquantel-resistant S. mansoni and S. japonicum strains or isolates in the lab or in the field. Another new issue is that praziquantel medication might cause allergic, hypersensitive, or anaphylactic responses in certain individuals.

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