Understanding Neurocysticercosis: The Parasitic Infection Impacting Brain Health.

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Introduction

Neurocysticercosis (NCC) is a parasitic infection of the central nervous system (CNS) caused by the larvae of the tapeworm Taenia solium. It is recognized as the most common parasitic infection of the human brain and the leading cause of acquired epilepsy worldwide. NCC predominantly affects individuals living in regions where sanitation and hygiene are poor and where pigs are raised under unhygienic conditions.

Epidemiology

NCC has a global distribution, but it is particularly prevalent in low- and middle-income countries, including regions of Latin America, Asia, and Africa. Within these regions, specific factors such as cultural practices, pig farming, and poor sanitation contribute to the high prevalence of NCC. However, globalization has led to an increase in NCC cases in non-endemic regions due to immigration and travel.

Pathogenesis

The life cycle of T. solium involves humans as definitive hosts and pigs as intermediate hosts. Infection occurs through the ingestion of contaminated food or water containing T. solium eggs. Once ingested, the eggs hatch in the intestines, and the larvae migrate to various tissues, including the CNS. In NCC, the larvae form cysticerci, which can lodge in the brain parenchyma, subarachnoid space, or ventricular system, leading to neurologic symptoms.

Clinical Manifestations

The clinical presentation of NCC varies widely depending on the location, number, and stage of the cysticerci. Common manifestations include seizures, headaches, focal neurologic deficits, and cognitive impairment. Seizures are the most common symptom and may be the presenting feature in up to 70% of cases. The severity of symptoms can range from mild to severe, with complications such as hydrocephalus and intracranial hypertension occurring in some cases.

Diagnostic Methods

Diagnosing NCC can be challenging due to its nonspecific clinical presentation and the lack of a definitive diagnostic test. Imaging studies, including computed tomography (CT) and magnetic resonance imaging (MRI), play a crucial role in the diagnosis of NCC. Characteristic findings on imaging include cystic lesions with scolexes, enhancing lesions, and calcifications. Serologic tests, such as enzyme-linked immunoelectrotransfer blot (EITB) and enzyme-linked immunosorbent assay (ELISA), can also aid in diagnosis.

Treatment

The management of NCC involves a combination of antiparasitic medications, such as albendazole or praziquantel, to kill the parasites, and anti-inflammatory agents, such as corticosteroids, to reduce inflammation and prevent complications. In cases of intracranial hypertension or hydrocephalus, surgical intervention may be necessary to relieve pressure and remove cysts. However, treatment approaches may vary depending on the location and severity of the disease.

Prevention and Control

Preventive measures are essential for controlling the transmission of T. solium and reducing the burden of NCC. These measures include improved sanitation and hygiene practices, proper disposal of human and animal waste, and health education initiatives to raise awareness about the risk factors for NCC. Additionally, mass treatment of pigs with antiparasitic drugs and meat inspection programs can help prevent the transmission of T. solium from pigs to humans.

Conclusion

Neurocysticercosis is a significant public health problem with serious implications for brain health. Despite advances in diagnosis and treatment, NCC remains a challenge, particularly in resource-limited settings. Continued efforts are needed to improve prevention, diagnosis, and treatment strategies to reduce the burden of NCC and improve outcomes for affected individuals. Collaboration between public health authorities, healthcare providers, and community stakeholders is essential to control this preventable and treatable disease.

References

1. Crompton DW (2001). Ascaris and ascariasis. Microbes Infect.2001; 3(4): 245-54.
2. Garcia LS. Diagnostic medical parasitology. American Society for Microbiology Press; 2006 Nov 29.
3. Han L, Ran J, Mak YW, et al. Smoking and Influenza-associated Morbidity and Mortality A Systematic Review and Meta-analysis. Epidemiology. 2019;30:405-17.

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4. Hotez PJ, Brindley, PJ, Bethony JM, et.al. (2008). Helminth infections: the great neglected tropical diseases. J Clin Invest.2008; 118(4): 1311-21.
5. Ishikawa Y, Terao C. The impact of cigarette smoking on risk of rheumatoid arthritis: a narrative review. Cells. 2020;9(2):475.
6. Lawrence H, Hunter A, Murray R, et al. Cigarette smoking and the occurrence of influenza–Systematic review. J Infect. 2019;79:401-6.
7. Moore J. Parasites and the Behavior of Animals. Oxford University Press (2002).
8. Pierce JP, Chen R, Leas EC, et al. Use of e-cigarettes and other tobacco products and progression to daily cigarette smoking. Pediatrics. 2021;147(2).
9. Wang B, Li R, Lu Z, et al. Does comorbidity increase the risk of patients with COVID-19: evidence from meta-analysis. Aging. 2020;12:6049-57.
10. World Health Organization. Soil-transmitted helminth infections (2020). Retrieved from https://www.who.int/news-room/fact-sheets/detail/soil-transmitted-helminth-infections