Emerging parasitic infections: a growing global health concern.

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Introduction

Parasitic infections remain a significant contributor to global morbidity and mortality, particularly in tropical and subtropical regions. In recent years, the emergence and re-emergence of parasitic diseases—driven by climate change, globalization, urbanization, and antimicrobial resistance—have raised new challenges for public health systems worldwide [1, 2, 3, 4]. This article provides a comprehensive overview of emerging parasitic infections, highlights the factors contributing to their spread, and discusses the implications for surveillance, diagnosis, and therapeutic strategies. Parasitic diseases have historically posed a major burden in resource-limited settings. However, recent global shifts have led to the emergence of parasitic infections in regions where they were previously rare or well-controlled. These emerging infections, often overlooked in mainstream infectious disease discourse, demand renewed attention due to their potential to cause outbreaks, disrupt healthcare systems, and challenge existing diagnostic and therapeutic protocols [5, 6].

Drivers of Emerging Parasitic Infections

Climate Change Rising temperatures and changing precipitation patterns influence the geographic distribution of vectors such as mosquitoes, sandflies, and snails. Diseases such as **malaria**, **leishmaniasis**, and **schistosomiasis** are now appearing in non-endemic regions, including parts of Europe and North America [7, 8, 9, 10].

Globalization and Travel Increased international travel and migration facilitate the rapid translocation of parasites and vectors. Cases of **Chagas disease** and **African trypanosomiasis** have been reported in non-endemic countries due to travel and immigration.

Urbanization and Environmental Changes Rapid urban development without adequate sanitation has created new breeding grounds for vectors, promoting the transmission of diseases like **giardiasis** and **cryptosporidiosis**.

Zoonotic Transmission The interface between human and animal populations has expanded, increasing the risk of zoonotic parasitic diseases such as **toxoplasmosis** and **echinococcosis**.

Notable Emerging Parasitic Infections

Neurocysticercosis: Increasing in urban settings due to poor sanitation and pork consumption.

Angiostrongyliasis (Rat lungworm disease): Emerging in Southeast Asia and the Pacific Islands.

Leishmaniasis: Expanding its geographic range due to sandfly migration linked to climate change.

Babesiosis: A malaria-like illness spread by ticks, increasingly diagnosed in the United States.

Dirofilariasis: A mosquito-borne infection caused by Dirofilaria spp., increasingly seen in parts of Europe and Asia.

Diagnostic and Therapeutic Challenges

Emerging parasitic infections often present with nonspecific clinical symptoms, making them difficult to diagnose without specialized tests. Traditional diagnostic tools like microscopy may be inadequate in detecting low parasite loads or mixed infections. Molecular diagnostic techniques, though more sensitive, are often unavailable in low-resource settings.

Therapeutic options are also limited, with some parasites exhibiting resistance to first-line antiparasitic drugs. The development of new therapies is slow due to limited investment in parasitic disease research, necessitating drug repurposing and combination therapies.

Future Directions and Recommendations

Enhanced Surveillance: Establishing global and regional networks for parasite monitoring.

One Health Approach: Integrating human, animal, and environmental health perspectives.

Diagnostic Innovation: Developing rapid, point-of-care diagnostics tailored to emerging infections.

Research Investment: Encouraging pharmaceutical and academic interest in parasitic diseases.

Public Health Education: Raising awareness among healthcare professionals and communities in emerging hotspots.

Conclusion

Emerging parasitic infections are no longer confined to traditional endemic zones. Their growing prevalence in new ecological and geographical contexts presents a pressing global health issue. Addressing these threats requires a multidisciplinary and collaborative approach to strengthen diagnostics, therapeutics, surveillance, and public health

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infrastructure. Timely recognition and proactive intervention can prevent these diseases from becoming major epidemics.

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