Transmission dynamics and control of Gnathostomiasis: Insights from dynamics modelling and Optimal control.

BIOMATH 2024

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Gnathostomiasis is a system food-borne parasitic disease. Gnathostomiasis is usually consumed/ingested in contaminated raw fish, which is one of the main risk factors. The parasite can infect many animals including domestic and wild felines and canines, domestic and wild pigs. Despite the fact that the disease is common in several regions of Asia and South America, very few patients have been reported in Africa. Control strategies including disinfecting contaminated water sources, providing medical care, and reducing contact rate have been introduced to reduce Gnathostomiaisis disease. The gnathostomiasis model was developed and analyzed. Sensitivity analysis and numerical results were obtained. We observed that the processes related to contact of individuals to Gnathostoma infected environments, water sources or food have the potential of worsening the disease when increased. In addition, increased shedding of the pathogen into the environment also has the potential of increasing the disease burden. Our results showed a higher estimation of the number of infections and hence the disease burden. The model was improved to consider controls that target the reduction in the number of infections. We found that all controls should be implemented to contain the infection. From the numerical results, we deduced that when all the controls are implemented, the disease can be contained.

A poster.

References

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