Cyclospora cayetanensis as a Global Health Problem

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Cyclospora cayetanensis is an important emerging cause of diarrhea worldwide that leads to significant morbidity and mortality. In developing countries, the parasite has been associated with diarrhea in health center populations. However, in communities based studies, infection rates up to 41.6% have been noted and most of the cases are asymptomatic [1]. In Venezuela, where intestinal parasites represent a persistent public health problem [2,3], cyclosporiasis is now pretty common. Infection rates of 5.3% in diarrheic children, 6.8-9.8% in AIDS patients, and 6.1-11.9% in communities have been found [1]. In the developing world, the infection has been associated with variables related to water, foods, and animals, and contact with soil. The coccidium has been found in water, vegetables, bivalves, and animals. However, the role that the latter may play in the epidemiology of cyclosporiasis remains controversial [1].

The increasing globalization of the food supply has contributed to the spread of C. cayetanensis from developing to developed countries. The parasite has emerged as a global public health problem. In recent decades, it has been recognized as having great potential to cause food- and waterborne diseases. Numerous outbreaks in United States and Canada have been documented, mostly associated with fresh food produce from the developing nations. Several of them have been associated with Guatemalan raspberries. In Europe and Australia, most of the cases have been linked to international travel in endemic areas. However, some food-borne outbreaks have been noted [1,4]. Other complicating factors in the prevention and control of cyclosporiasis are the recent unprecedented flow of people, increasing number of immunocompromised hosts, greater international trade, and changing human behavior and demographics that make infection an even greater potential issue.

Significant gaps remain in our knowledge of the biology and epidemiology of the parasite. The relative importance of the various sources and spread routes of the parasite and its survival, viability, and virulence are unclear. Although C. cayetanensis is considered a food- and waterborne parasite [4], contact with soil and environments conducive to human fecal contamination have been associated with infection [5,6]. Increasing amounts of research is needed to know the significance to human health of Cyclospora in the environments. Improvements of the methods and systems for diagnosis and epidemiology of Cyclospora will allow a better assessment of its risks and effective control measures.

Implementation of measures to decrease or avoid the spread of Cyclospora oocysts in the environment is critical. In developing countries, the most important steps to prevent infection are health education, changing eating habits, proper sanitary infrastructures, and safe drinking water. However, these steps are difficult challenges for these areas. Global health organizations have proposed recommendations for controlling waterborne protozoa that could be used for Cyclospora. The food industry needs to prevent contamination of the food chains, and control any source of contamination. Development and monitoring of on-farm control measures in endemic regions are necessary to diminish or avoid future outbreaks in the developed world. Better disinfection techniques for imported produce will improve food quality and safety.

The deficiencies in our knowledge of epidemiology and other issues of the parasite challenge the implementation of effective prevention and control strategies. It is necessary to pull together the global efforts to prevent cyclosporiasis, and strengthen partnerships and to bring them into a coherent whole. Maximizing the interaction among different disciplines such as parasitology, epidemiology, public health, and molecular biology is imperative for unveiling the secrets of this enigmatic parasite which will conduct to effective strategies to control coccidian contaminant. The help from global health organizations on surveying, preventing, and responding to outbreaks; improving the safety of international supply chains; and sharing the best practices worldwide is crucial. Promotion of Open Access Movement is important for the flow of knowledge, innovation, translation of findings into new or improved preventive, diagnostic, and treatment products, and world socio-economic development.

A realistic solution for controlling cyclosporiasis, requires a multidisciplinary focus that includes sciences related to the field of parasitology, and social sciences; the cooperation of the international health organisms; and the implementation, by the governments, of programs of sanitary education, environmental sanitation, and adequate house construction.

References


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