Susceptibility and Infection Risk of Schistosomiasis Disease

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Abstract

The environment of schistosomiasis epidemic areas in China is complex with various forms of geomorphologies. The spatial distribution of schistosome (*Schistosoma japonicum*) and parasitic hosts is random. It is often difficult to eradicate snails(*Oncomelania* snails) and cercaria, and to avoid interactions with schistosomiasis-susceptible areas for livestock and humans. Rapid, efficient and timely determination of schistosomiasis-susceptible area holds significant importance. This paper first introduces the initial origin and various definitions of schistosomiasis-susceptible area. We present a new definition according to the key parameters that influence the epidemic and transmission of schistosomiasis. Secondly five study aspects of schistosomiasis-susceptible area are summarized in light of the factors that have influences on the formation of schistosomiasis- susceptible area. Problems, drawbacks and causes in different concepts and study methods of schistosomiasis-susceptible area are introduced. Perspectives of historical medical-geography study of schistosomiasis-susceptible area are reviewed. We present spatial simulation and modeling approaches that are based on remote sensing and geographic information systems(GIS) and data-driven models and knowledge-driven model. They represent an important area of new applications of remote sensing and GIS in health related problem solving. Finally, we suggest to import the concepts in hazard/risk analysis into the schistosmiasis epidemiology. This allowed us to put forward two new concepts: susceptibility level and infection risk, for which a primary calculation framework and internal relation is established. We hope to use them as the base for future studies of chistosomiasis-susceptible areas.

Keywords

schistosomiasis-susceptible areas, theoretic definition, study methods, geographic modeling, conceptional framework of hazard/ disaster study