RESISTANCE TO NICLOSAMIDE IN ONCOMELANIA HUPENSIS, THE INTERMEDIATE HOST OF SCHISTOSOMA JAPONICUM: SHOULD WE BE WORRIED?

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Schistosoma japonicum infection remains a major public-health concern in China. Currently, an estimated 0.7 million Chinese are thought to have this disease, and the intermediate host Oncomelania hupensis, a freshwater snail, is still present in numerous areas covering a total of 3.73 billion m². Since the transmission of this neglected tropical disease is governed by the geographic distribution of O. hupensis, control of this snail, as a major part of the National Schistosomiasis Control Program of China, has been implemented in attempts to interrupt the transmission of the disease. As the currently only available molluscicide, niclosamide has been widely used for snail control for over two decades in China. There is therefore a concern about the emergence of niclosamide-resistant snail populations following repeated, extensive use of the chemical. The purpose of this study was to investigate the likelihood of niclosamide resistance in O. hupensis. Active adult O. hupensis snails were derived from 20 counties of 10 schistosomiasis-endemic provinces of China. Ten snails in each drug concentration, were immersed in solutions of 1, 0.5, 0.25, 0.125, 0.063, 0.032, 0.016 and 0.008 mg/L of 50% wettable powder of niclosamide ethanolamine salt (WPN) for 24 and 48 h at 25°C. The LC₅₀ values were estimated. Then, the 24- and 48-h WPN LC₅₀ values were compared to those determined in the same sampling sites in 2002. The results indicated the 24- and 48-h WPN LC₅₀ values for O. hupensis were not significantly different from those determined in 2002. It is concluded that the current sensitivity of O. hupensis to niclosamide has not changed after more than 2 decades of repeated, extensive application in the main endemic foci of China, and there is no evidence of resistance to niclosamide detected in O. hupensis.