

CLONORCHIASIS IN TAIWAN

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Abstract. Since Ohi in 1915 found clonorchiasis patients in Taiwan, many surveys have shown that Miao-li in the north, Sun-moon Lake in the middle and Mei-nung in the south of Taiwan are three important endemic areas of clonorchiasis. In recent studies, the disease showed a tendency to extend its endemicity. Rats, cats, dogs and pigs are the natural reservoir hosts, and 17 species of fresh water fish are also infected with metacercaria. One definitive snail host, *Parafossarulus manchouricus*, and two other suggested snails, *Semisulcospira libertina* and *Thiara granifera*, may serve as the first intermediate host. The human incidence is about 20–50% in endemic areas and 10–20% in newly infected localities. Higher infection rates and more intensities of the worm burden are observed in the adult males. A higher incidence is also observed in the Hakkanese ethnic group. The infection according to the occupation has changed from merchants and government employees to farmers. Praziquantel, 60mg/kg body weight divided into three doses by oral route in one day, has been given to 356 patients and revealed a 96% cure rate and a 99% egg reduction rate. This regimen is highly recommended for the treatment of clonorchiasis.

INTRODUCTION

Since Ohi (1915) found clonorchiasis patients in Taiwan, many surveys have shown that Miao-li in the north, Sun-moon Lake in the middle and Mei-Nung in the south are three important endemic areas of clonorchiasis on Taiwan. In recent investigations, this parasitic zoonosis has shown a tendency to extending its endemicity. This paper presents a review, the current status and some other aspects of clonorchiasis in Taiwan.

EPIDEMIOLOGICAL ASPECTS

Animal reservoir hosts, ie, rats, cats, dogs and pigs, have been found to be the natural reservoir hosts (Cross, 1969; Wang *et al*, 1980; Wang *et al*, 1981). Among them, the incidence in pigs (Wang *et al*, 1980) has been shown to be the highest with a 0.4–13.2% infection rate.

The first intermediate hosts include the snail *Parafossarulus manchouricus* and two suggested snails, *Semisulcospira libertina* and *Thiara granifera*, in Taiwan.

Fresh-water fish serve as the second intermediate hosts, with 17 species of fish (Cross, 1969; Wang *et al*, 1981) found with the metacercariae of *Clonorchis sinensis*. *Mugil cephalus* and *Ctenopharyngodon idellus* are the most highly

infected fish with above 80% infected. *C. Idellus* and *Thirapia hybrid* are commonly and frequently consumed raw as sashimi by people residing in the endemic areas.

Human infection occurs in about 20–50% in endemic areas (Cross, 1969; Chen *et al*, 1979), and 10–20% is reported in newly infected localities (Cross, 1969). Higher infection rates and more intensities are observed in the adult male population (Yen *et al*, 1987; Yen *et al*, 1988). The higher rates are observed in the Hakkanese ethnic group (Ong and Lu, 1979). According to occupation, merchants and government employees had higher infection rates in the past, but today the rate is higher in farmers due to encouragement of raising freshwater fish near pigsties, which results in the farmers having more opportunities to eat raw fish.

DIAGNOSIS

Clonorchiasis is mainly diagnosed by the finding of eggs from feces or from bile. Worms can be detected sometimes by ultrasonography, choledochoscopy or cholangiography (Hou *et al*, 1989a; Hou *et al*, 1989b). Immunodiagnosis by means of ELISA is more sensitive than other technics (Chen *et al*, 1987; Chen and Yen 1985 a; Chen and Yen, 1985b; Yen *et al*, 1984, Lin *et al*, 1990).

CHEMOTHERAPY

Praziquantel has been reported to be highly effective against clonorchiasis in Taiwan with the dosage of 3×25 mg/kg for one or two days (Chen and Hsieh, 1982; Chen and Yen, 1984; Hwang, *et al*, 1987). With a reduced treatment dose of 32×20 mg/kg for one day, a cure rate of 95.5% and an egg reduction rate of 98.7% were obtained from 356 patients.

PREVENTION CONTROL

Eating raw or improperly cooked fresh water fish is the most important source of infection of *C. sinensis*. Education of people requires a long period of time and also requires propaganda. Gamma-ray (50–200 Krad) irradiation of metacercariae of *C. sinensis* in fish has been studied experimentally in guinea pigs; no worms were found after feeding in guinea pigs (Chen and Pai, 1989). This suggests that the gamma-ray irradiation of fish can prevent infection of *C. sinensis*.

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