The Korean Journal of Parasitology
Vol. 31, No. 4, 375-378, December 1993

☐ **Brief Communication** ☐

Intestinal parasite infections in the inhabitants along the Hantan River, Chorwon-gun

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Abstract: The prevalence of intestinal parasite infections in inhabitants at the reaches of the Hantan River, Chorwon-gun, Korea, was observed from August 12 to September 14, 1993. Of 465 people observed by cellophane thick smear and formalin-ether concentration method, 2 *Ascaris lumbricoides* (unfertilized), 1 *Trichuris trichiura*, 39 *Clonorchis sinensis* and 16 *Metagonimus* egg positive cases were found. After treatment, the *Metagonimus* egg positive cases passed out flukes of *Metagonimus* Miyata type. Of 68 fish caught in the Hantan River, 14 (20.6%) were infected with metacercariae of *Metagonimus*, while no metacercaria of *C. sinensis* was found. At this area, soil-transmitted nematodes are very low, but clonorchiasis and metagonimiasis are prevalent by modernate endemicity.

Key words: Intestinal parasite, *Clonorchis sinensis*, *Metagonimus* spp., fish, epidemiology, the Hantan River

The results of the recent nation-wide stool examination in Korea showed steady and marked decrease of the intestinal parasites during the past 21 years. Especially the soil-transmitted nematodes, such as *Ascaris lumbricoides* (egg positive rate in 1992: 0.3%), hookworm (0.01%), *Trichuris trichiura* (0.2%) and *Trichostrongylus orientalis* (0.004%) are now evidently under control. Unlike these nematode infections, clonorchiasis is still persisting (2.2%) in riverside areas although the worm burden is decreasing. It is strongly required to control clonorchiasis over the country (Ministry of Health and Social Affairs & Korea Association of Health, 1993). Endemic foci of clonorchiasis are, as well known, scattered along riverside areas in Korea (Seo *et al.*, 1981). In the riverside areas of the Hantan River, Chorwon-gun, Kangwon-do where the ecology is relatively well preserved because of its location near demilitarized zone, we made a small survey to evaluate endemicity of the intestinal parasite infection.

We visited the Chorwon-gun Health Center on August 12, 1993 and collected the stools of the inhabitants in 8 villages (Yangji-ri, Kuntan-ri, Tochang-ri, Yugok-ri, Taema-ri, Chigyong-ri, Chongyon-ri, Mahyon-ri, and Naedae-ri). We examined stools for the helminth ova by both the cellophane thick smear and the formalin-ether concentration method. We also caught the fresh water fish in the Hantan River near the villages. Each fish was digested with artificial gastric juice (0.6% w/v pepsin, 1%

• Received Oct. 2 1993, accepted after revison Oct. 20 1993.

• This study was supported in part by the Research Grant from the Korea Association of Health (1993).

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v/v HCl in distilled water) for two hours after grinding. The metacercariae of *Metagonimus* was counted and collected under a stereoscope. The metacercariae were experimentally infected to a dog. Stool of the dog was examined for the eggs of *Metagonimus* after three weeks. Also *Metagonimus*-egg positive cases were treated with praziquantel (Distocide®, Shinpoong Pharmaceutical Co.) 600 mg once, and magnesium purgation was done for worm collection.

Egg positive rate of the intestinal parasite from 465 inhabitants was summarized in Table 1. Clonorchiasis and metagonimiasis are major parasitoses there. Egg positive rate of *C. sinensis* was relatively high in age groups of 31-40 (13.8%), 41-50 (9.3%), 51-60 (6.5%), over 61 (9.6%), and low in age groups of 11-20 (3.1%), 21-30 (4.9%). Egg positive rate in men (11.3%) was higher than in women (4.2%). Egg positive cases of *Metagonimus* were included in age groups of 31-40 (7.5%), 41-50 (3.5%), 51-60 (3.7%), over 61 (2.8%), and absent in age groups of 11-30. Egg positive rate in men (4.7%) was also higher than in women (1.6%). Of 16 egg positive cases, 11 participated in the procedure of worm recovery. The worms were recovered from only four of them, and 1, 6, 107, and 139 worms collected.

The *Metagonimus* egg size from the infected dog was 28.5 ± 1.4 × 17.4 ± 1.2 μm. We could identify the specimens from the egg positive inhabitants as *Metagonimus* Miyata type according to Chai *et al.* (1993) in the following points: 1) Uterus passes between two testes 2) Vitellaria end at the mid-level of the posterior testis 3) Mean size of 20 eggs is 29.5 ± 0.8 × 17.4 ± 0.3 μm. All of the collected worms were identified as *Metagonimus* Miyata type.

Table 1. Result of stool examination of the inhabitants in the riverside area of the Hantan River, Chorwon-gun.

No. of examined	465
No. of cumulative positive	58 (12.5%)
No. of positive	51 (11.0%)
Ascaris lumbricoides (Unfertilized)	2 (0.4%)
Trichuris trichiura	1 (0.2%)
Clonorchis sinensis	39 (8.4%)
Metagonimus spp.	16 (3.4%)

The metacercariae of *Metagonimus* were detected from 6 species of fish (Table 2).

We can only compare our results of stool examination with results of the students in Chorwon-gun, 1992; *A. lumbricoides* 0.1%, *T. trichiura* 0.04%, *C. sinensis* 0.009%, *Metagonimus* spp. 0.02% (Korea Association of Health, 1993). Except *C. sinensis* and *M. yokogawai*, the results were comparable. The parasitological characteristics of this area is similar with those of other riverside areas in Korea, *i.e.*, high endemicity of clonorchiasis and/or metagonimiasis but very low level of the soil-transmitted nematodiasis(Kim *et al.*, 1990; Chai *et al.*, 1993; Lee *et al.*, 1993). The 5th nation-wide survey in Kangwon-do showed that the egg positive rates of *C. sinensis* and *M. yokogawai* were 1.3 and 0.1% respectively (Ministry of Health and Social Affairs & Korea Association of Health, 1993). Although our survey is not statistically standardized, we can say that the egg positive rate of *Clonorchis* and *Metagonimus* in this subjects is higher than that in general population of Kangwon-do. Of course, the reason is the habitual eating of raw fresh water fish, since the river in studied area is less contaminated. The infection rate of clonorchiasis and metagonimiasis is high among 31 to 50 year-old men, just like in other reports (Kim *et al.*, 1990; Lee *et al.*, 1993; Ministry of Health and Social Affairs & Korea Association of Health, 1993). The two flukes must be prevalent in the survey area although metacercariae of *C. sinensis* were not detected.

ACKNOWLEDGEMENT

We appreciate the officers of the Chorwon-gun Health Center who provided us the working space and helped us do this study. We also thanks inhabitants who agreed to be treated and endured the procedure of the worm recovery. Praziquantel (Distocide®) used in this survey were kindly donated by President Yong Taek Chang, Shinpoong Pharmaceutical Company, Seoul, Korea. We are grateful to Mr. Ho-Bok Song, Department of Biology, Kangwon National University, Chunchon, Korea for his kind identification of the fresh-water fish.

Table 2. Result of the detection of metacercariae of *Metagonimus* spp. from fishes (Cyprinidae) caught in the Hantan River

Name of fishes	No. examined	No. positive (%)
Cyprinidae (잉어아과)		
Carassius auratus (붕어)	1	1 (100)
Rhodeinae (납줄개아과)		
Acheilognathus yamatsutae (줄납자루)	2	0
Acheilognathus signifer (묵납자루)	6	2 (33.3)
Acheilognathus intermebia (납자루)	2	0
Acheilognathus rhombea (납지리)	7	0
Gobioninae (모래무지아과)		
Hemibarbus longirostris (참마자)	6	1 (16.7)
Hemibarbus mylodon (어름치)	5	4 (80.0)
Sarcocheilichthys variegatus wakiyae (참중고기)	5	4 (80.0)
Pungtungia herzi (돌고기)	10	0
Pseubogobio esoctnus (모래무지)	4	0
Microphysogobio longidorsalis (배가사리)	1	0
Leuciscinae (황어아과)		
Zacco platypus (피라미)	11	3 (27.3)
Zacco temmincki (갈겨니)	8	3 (37.5)
Total	68	14 (20.6)

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=국문초록=

강원도 철원군내 한탄강 유역의 장내 기생충 역학조사

한국건강관리협회 강원도 지부[1]와 한림대학교 의과대학 기생충학교실[2]

박명성[1], 김선웅[1], 양용상[1], 박찬홈[2], 이원태[2], 김창억[2], 이은미[2], 이수응[2], 허선[2]

강원도 철원군 한탄강변에서 장내기생충증의 유행을 알기 위해서 1993년 8월 12일부터 9월 14일까지 주민 465명을 대상으로 대변검사하고 민물고기에서 피낭유충을 조사하였다. 불수정회충란 2, 편충란 1, 간흡충란 39, 메타고니무스충란이 16 명에서 발견되었다. 메타고니무스충란 양성자로부터 회수한 충체는 Miyata형 메타고니무스로 동정하였다. 잡은 민물고기 68마리 가운데 14마리(20.6%)에서 메타고니무스의 피낭유충을 발견하였고, 발견된 민물고기는 피라미, 갈겨니, 참마자, 어름치, 참중고기, 묵납자루, 붕어이었다. 그러나 간흡충의 피낭유충은 발견하지 못하였다. 이 지역에서는 토양매개성 선충이 극히 낮은 양성률을 보였으나 간흡충과 메타고니무스는 일정한 유행도를 가지면서 분포하고 있음을 확인하였다.

(기생충학잡지, 31(4): 375-378, 1993년 12월)