An Egg-negative Patient of Acute Metagonimiasis Diagnosed Serologically by ELISA

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Abstract
A 46-year old male was admitted to Seoul National University Hospital with the clinical complaints of fatigue, watery diarrhea and abdominal discomfort for 15 days. Trematode infection especially metagonimiasis was suspected because of his recent history of consumption of raw sweetfish, the intermediate host of Metagonimus yokogawai. Repeated fecal examination revealed no eggs. Serological test by enzyme-linked immunosorbent assay (ELISA) exhibited positive antibody level for M. yokogawai antigen. The diagnosis was confirmed by recovery of 110 adult specimens of M. yokogawai expelled after chemotherapy with praziquantel. The present patient shows that serological diagnosis is necessary in some cases of metagonimiasis.

Key words: Metagonimus yokogawai, Metagonimiasis, Serological diagnosis, ELISA

INTRODUCTION
Metagonimus yokogawai infection is widely distributed in southern parts of Korea (Seo et al. 1969 & 1981). Especially along the Sumjin river valley, endemic foci are scattered and as many as half of the people were found infected (Yeo and Seo 1971). Most of the sweetfish (Plecoglossus altivelis) caught in the river are harbouring the metacercariae (Hong and Seo 1969; Song et al. 1985). This infection is diagnosed by detecting the characteristic eggs in the patient’s feces.

Clinical manifestation in M. yokogawai infection may be variable. Typical symptoms such as fatigue, bouts of watery diarrhea with abdominal pain and eosinophilia are, in general, manifested in acute stage of infection. Chronic infections, constituting the majority of cases in endemic areas, are generally symptom-free. Even heavily infected people may reveal little symptom. Pathologically intestinal mucosa shows atrophy of villi and hyperplasia of crypts in man (Chi et al. 1988) and animals (Chai 1979; Lee et al. 1981).

Only a few studies have been done in immunological aspects of metagonimiasis. Cho et al. (1987) described that specific serum antibodies (IgG) were increased from day 7 after infection and reached their peak at 2-4 weeks. This result has indicated that serological test may be applicable for human metagonimiasis. Recently we experienced an egg-negative patient of acute metagonimiasis in whom serological test was needed for the diagnosis.

CASE PRESENTATION
The patient was a 46-year old man who complained of extreme fatigue, watery diarrhea and abdominal discomfort for 15 days. Just 5 days before the onset of the above symptoms, he
had eaten the raw flesh of sweetfish caught at Hwagae-myon, Hadong-gun in the Sumjin river valley. Four to ten attacks of abdominal pain followed by profuse watery diarrhea occurred in a day, and signs of dehydration developed. Upper G-I and lower bowel radiology revealed no abnormalities. Laboratory studies revealed normal findings except 22-34% eosinophilia (1390-1490/μL in absolute count).

Stool examination by formalin-ether technique done 5 times every other day (from day 21 to day 29 after the ingestion of sweetfish) revealed neither eggs nor cysts. Numerous Charcot-Leyden crystals were found in fecal smears. Serological test by ELISA was done on the 26th day as described by Cho et al. (1987), which revealed a positive level against M. yokogawai antigen (absorbance 0.64; positive criterion 0.25). In duodenal aspiration no worms nor eggs were found. Peroral suction biopsy from the jejunum revealed histopathologically severe atrophy of villi, with hyperplasia of crypts (Figs. 1 & 2). These were thought probably secondary to some parasitic infection, though worms were not found. The atrophied villi were characterized by shortening of their height, blunting at the tips, fusion, and inflamed stroma with infiltration of lymphocytes, plasma cells and eosinophils (Figs. 1 & 2).

A trial of therapeutic diagnosis was done on the 30th day after the ingestion of sweetfish. Praziquantel in single dose of 10 mg/kg was given orally. In 3 diarrheal stools induced by the administration of magnesium sulfate, total 110 specimens of adult M. yokogawai were collected (Fig. 3). The worms were 9.5 mm long and 3.8 mm wide in average. Non-reproductive organs such as suckers and cea were fairly well-developed. Male genital organs also developed well. However, female organs such as seminal receptacle, vitelline follicles and uterus showed their poor maturity. The uterine coil contained only a few eggs (3 on average) without miracidium.

After the chemotherapy, the diarrheal attacks stopped in 2 days and general condition improved in 5 days.

DISCUSSION

The present case manifested typical symptoms of acute metagonimiasis. Interestingly, eggs were not found in the patient's stool while specific antibody (IgG) level, as measured by ELISA, was elevated. The diagnosis by ELISA was confirmed by the recovery of worms. After specific treatment, the symptoms improved almost immediately.

In this patient, there is some irrelevance with the previous knowledge concerning M. yokogawai infection. The number of eggs in the uterine coil of worms is much smaller than normal; on
at the initial stage of infection was much greater than the harvested number which decreased quickly as the disease progressed.

The present case made us presume that some immunologic mechanisms had worked on *M. yokogawai* worms as well as on the small intestinal mucosa during the course of acute infection. Due to those unrecognized mechanisms, the worm number and fecundity of worms were reduced. Similar mechanisms may be involved in the pathogenesis of mucosal lesions seen in metagonimiasis or other parasitic diseases (Olson and Richardson 1968; Lee et al. 1985), coeliac disease (Shiner and Doniach 1960) or tropical sprue (Swanson and Thomassen 1965). As Ferguson and Jarrett (1975) and Manson-Smith et al. (1979) reported T-cell immunity may be responsible for the mucosal lesions such as atrophy of villi. The immune destruction of small intestinal villi can complement a view that villi were mechanically or enzymatically damaged by the parasites or other causative agents (Roh et al. 1984) in explaining the pathogenesis of non-specific mucosal lesions.

The present patient showed it clear that serologic test for specific antibody is necessary in some patients of metagonimiasis. In order to understand the applicability of the serologic test, studies in human population is necessary in the future.

Fig. 3. An adult specimen of *M. yokogawai* recovered from this patient. Organs such as oral sucker (OS), ventral sucker (VS), ovary (OV), tests (T) and seminal vesicle (SV) are fairly well-developed. However, other genital organs such as seminal receptacle and vitellaria are showing their poor maturity, with few eggs (arrow heads) in the uterus (scale: 0.1 mm).

the 30th day of infection, it was reported that about 300 eggs were contained in the uterine coil of a worm (Ahn et al. 1981). In addition, the symptoms and pathology in the small intestine were inappropriately severe, compared with the number of worms recovered. The actual number of the infected worms at the time of treatment may have been greater than 110 because the diarrheal stools were collected only 3 times. The 4th stool may have contained a lot of worms. It is also speculated that actual number of worms

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혈청학적으로 진단된 요꼬가와흡충증 1례

서울대학교 의과대학 가정증상학과 및 홍도방영구소, 대학과학교실*, 및 휴양대학교 의과대학 가정증상학과**

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요꼬가와흡충증 환자에 의한 요꼬가와흡충 항체에 대하여 양성 반응을 보였고, 브라질판 두어 두 증례를 수습함으로써 확인되었다.

환자는 46세 남자로 설사 및 무동성이 심각한 것으로 15일간 계속되어 입원하였으나 5회 시행한 대변검사에서 흡충이 검출되지 않았고 다른 원인도 찾을 수 없었다. 그러나 음년 생일 후 26일째에 시행한 혈청 항원체면역단백 (micro-ELISA) 검사에서 흡충의 항원 0.64(양성기준: 0.25 이상)로 양성반응을 보였다. 경구 경과 생검 (peroral jejunal biopsy)에서 흡도 위장관과 절단된 요꼬가와와 흡충충이 기타 장갑 결절에서 보이는 것과 동일한 조직 소견이 관찰되었으나 중후병 발생되지 않았다.

경구 중후병을 얻어 확진한 목적으로 브라질판 40mg/kg를 두어하였고 하루 두어 세력 설사변은 수술하였던 이후나 3회의 설사변으로부터 요꼬가와흡충 즐 110마리로 검출할 수 있었다. 중후병 내부로 생검한 병변의 양이 약간 다르고 3개월 간 2개월 더 일어 난상임을 중후병의 중후병으로 진단되었다. 중후병의 발전이 감소 중후병이 지속적으로 증가를 없였던 환인이 되었을 것으로 추정하였다.

이 중후병은 흡충충의 유충증, 특히 장갑 결절이 여려운 것을 진단하기 위해 ELISA와 같은 혈청학적 진단법이 유효한 것을 나타내는 증례로 생각되었다.