

A Case of Metagonimiasis Complicated with Multiple Intracerebral Hemorrhages and Diabetes Mellitus

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Abstract

Metagonimiasis yokogawai is an unusual intestinal parasitic disease caused by metacercariae of *Metagonimus yokogawai*. The first clinical manifestations of this disease do not always correlate with gastrointestinal signs. A 61-year-old man with left hemiparesis and disorientation was admitted to our hospital because of atypical nonhypertensive multiple intracerebral hemorrhages, which were conservatively treated. The patient was discharged from our hospital after 2 months without any neurological deficits; however, he was readmitted owing to a body temperature higher than 38°C for nearly 2 weeks. Examination of stool revealed eggs of *M. yokogawai*, and the body temperature returned to normal after administration of praziquantel. Furthermore, the control of the patient's diabetes mellitus (DM) markedly improved after the treatment, although the patient had had DM for more than 2 years. We conclude that DM is a chronic sign of metagonimiasis in carriers and that intracerebral hemorrhage might be an acute sign in the aggravated phase of the disease. (J Nippon Med Sch 2008; 75: 32–35)

Key words: diabetes mellitus, intracerebral hemorrhage, metagonimiasis, parasite, trematode

Introduction

Metagonimiasis yokogawai is an unusual parasitic disease caused by metacercariae of *Metagonimus yokogawai*, an intestinal trematode that infects people consuming freshwater fish such as ayu (*Plecoglossus altivelis*), ugui (*Tribolodon hakonensis*), and shirauo (*Salangichthys microdon*)^{1,2}. With the increase in the popularity of these fish, the number of cases of

metagonimiasis has also been increasing since 1990 in Tokyo¹. Most patients with metagonimiasis are asymptomatic carriers, although many *M. yokogawai* eggs are detected in the stool³, and the infection in some of these patients may resolve spontaneously⁴. Here we present a case of metagonimiasis yokogawai that was extremely difficult to diagnose because the clinical manifestations included multiple intracerebral hemorrhages (ICHs) without intestinal symptoms.

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Case Presentation

A 61-year-old man residing in Tokyo was admitted to our hospital because of sudden onset of disorientation and left hemiparesis (MMT: U/E=4/5, L/E=4⁺/5). His conscious level was 14 (E4V4M6) on the Glasgow coma scale, and he responded slowly to our questions. Computed tomography (CT) revealed multiple ICHs in the right thalamus and the right frontal lobe (**Fig. 1A**), and both of the hematomas were small enough for conservative therapy. Angiography showed no vascular abnormalities, such as tumor staining or arteriovenous malformation (**Fig. 1B**). He had no history of hypertension, and his blood pressure was 132/84 mmHg on admission. This patient had 2-year history of diabetes mellitus (DM) and had been receiving 2.5 mg of glibenclimide per day. The fasting blood glucose level was 229 mg/dL, and hemoglobin A_{1c} (HbA_{1c}) level was high at 10.1%. Ophthalmologic examination revealed mild proliferating retinopathy, suggesting retinal changes due to prolonged DM (**Fig. 1C**). The patient's daily caloric intake was restricted to 1,600 kcal, and physical rehabilitation was started within 1 week after admission. On admission, body temperature was 37.6°C; the white blood cell (WBC) count was 11,000/ μ L (8.2% of WBCs were eosinophils); and the C-reactive protein (CRP) level was 2.5 mg/dL. As shown in **Figure 2**, the body temperature and laboratory data (WBC count and CRP) fluctuated but normalized during hospitalization. After 2 months, the patient's level of alertness improved, and the left hemiparesis recovered completely. Although a definite conclusion could not be made regarding the cause of the ICHs, the patient was discharged from our hospital with a normal body temperature and normal WBC count (**Fig. 2A and 2B**).

After 2 weeks, the patient was readmitted to our hospital with a body temperature higher than 38°C that had persisted for nearly 2 weeks. On readmission, the body temperature was 38°C (**Fig. 2A**), and laboratory data suggested severe infectious disease with eosinophilia (WBC count, 10,200/ μ L with 10% eosinophils; CRP, 12.5 mg/dL; **Fig. 2B**). No

gastrointestinal symptoms were present; however, eggs of *M. yokogawai* were detected in feces (**Fig. 3**). The patient received a single 1,200 mg oral dose of praziquantel, after which the body temperature did not increase to more than 37°C and all laboratory data normalized (**Fig. 2A and 2B**). At the time of discharge, the body temperature was 36.2°C; the WBC count was 7,400/ μ L with 3.8% eosinophils; and the CRP level was 0.2 mg/dL. Furthermore, the fasting blood glucose level decreased to less than 100 mg/dL with a daily calorie intake of 2,200 kcal (**Fig. 2C**). Glibenclimide was discontinued, and HbA_{1c} had decreased to 5.7% 2 months after the second admission. The patient was discharged after eradication of *M. yokogawai* had been confirmed by the absence of eggs on repeated stool examinations.

Discussion

The most common primary manifestations of metagonimiasis yokogawai include abdominal pain, diarrhea, and loss of appetite²; however, most patients are asymptomatic even though many *M. yokogawai* eggs are detected in stool⁴. Moreover, it is reported that more than half of the asymptomatic patients are naturally cured without medical treatment⁸. We considered retrospectively that the deteriorated conditions of our patient caused by metagonimiasis yokogawai might improve naturally with transfusion and bed rest during the first admission. Patients infected with *M. yokogawai* generally show 2 types of symptoms: chronic and acute. Chronic symptoms include general fatigue, fever, and weight loss⁸, whereas acute symptoms include abdominal pain, diarrhea², and pleural effusion⁴. In our patient, DM might have been a chronic symptom and ICH an acute symptom. Metagonimiasis cannot be diagnosed without stool examination. Some patients who exhibit only chronic symptoms may be misdiagnosed to have common cold or another disease; however, the diagnosis is also difficult in patients with acute symptoms if they are not associated with gastrointestinal findings. Metagonimiasis yokogawai symptoms vary from patient to patient; hence, our patient did not demonstrate any signs of ICH during the second

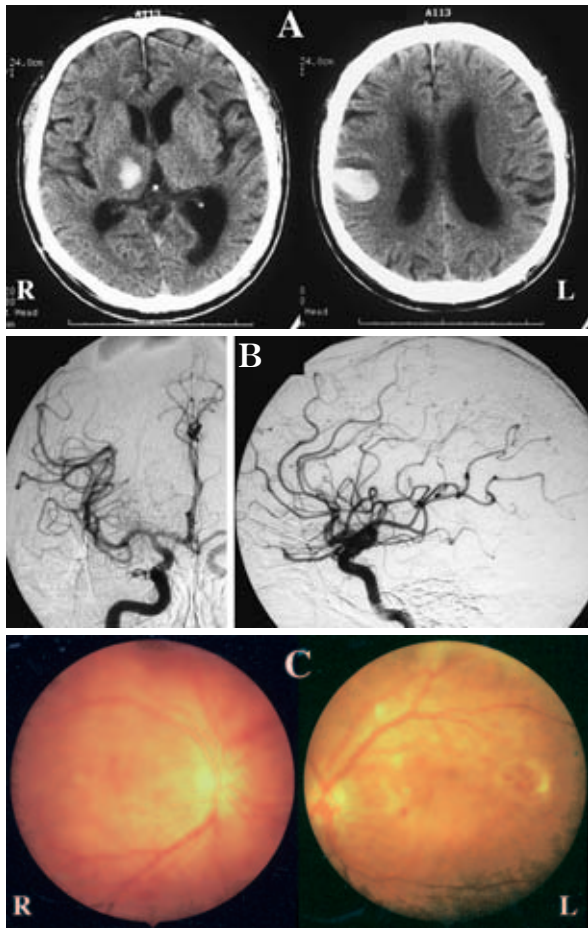


Fig. 1 A) Plain CT scan on admission: Multiple ICHs were identified in the right thalamus and the right frontal lobe. A mild mass effect was observed around both hematomas. B) Angiography: No vascular abnormalities, such as arteriovenous malformation and tumor staining, were observed in this study. C) Optic fundus examination: Moderate arteriosclerosis was observed in both optic fundi. Mild neovascularization was also detected with white spotty lesions in both retinas, consistent with mild proliferating retinopathy.



Fig. 3 Stool examination reveals an *M. yokogawai* egg in the patient's feces.

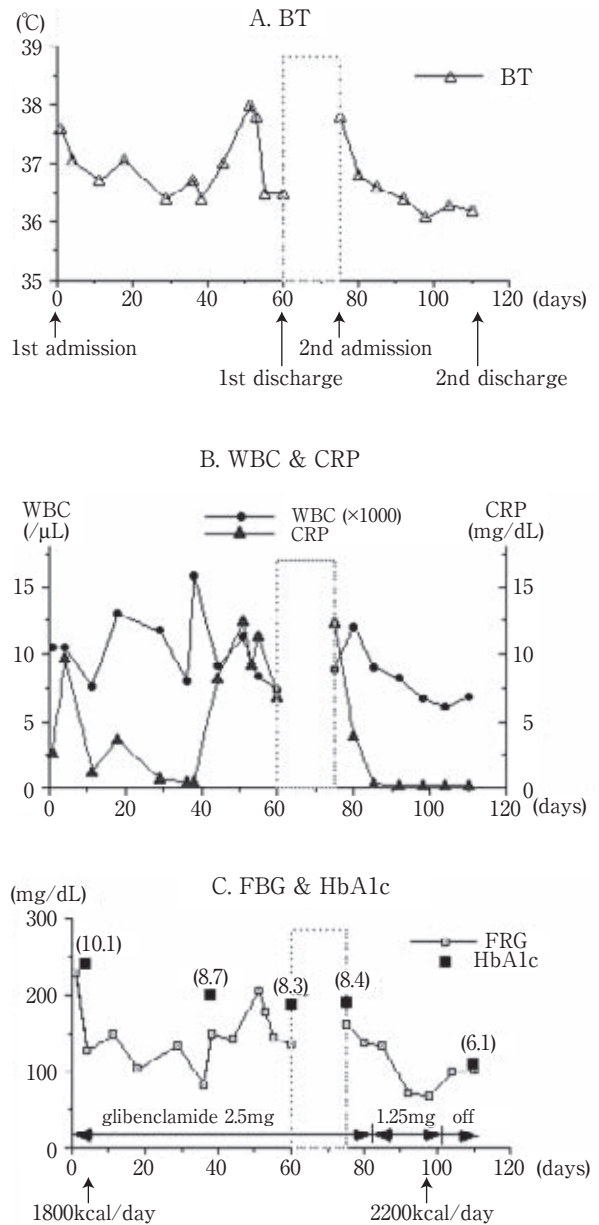


Fig. 2 Changes in the laboratory data of the patient during hospitalization. A) Changes in body temperature: The patient was discharged 60 days after the first admission with a normal body temperature and spent 2 weeks at home; he was then readmitted to our hospital with an elevated body temperature. B) Changes in the WBC count and CRP level: The WBC count and CRP level fluctuated greatly during the first admission. However, the values of both variables normalized after the treatment during the second admission. C) Improved glucose tolerance and decreased hemoglobin A1c (HbA1c) level: After treatment with praziquantel, fasting blood glucose decreased markedly to 72 mg/dL when the daily caloric intake was reduced to 1,800 kcal; the daily caloric intake was then increased to 2,200 kcal.

admission despite the worsening of his general conditions and laboratory data.

We did not consider parasitic disease in our patient when CT revealed multiple ICHs. Despite the presence of fever and abnormal laboratory data, we first thought that this patient with DM had cerebrovascular disease. Hypertension is the main risk factor for ICH, and DM is a risk factor for intracerebral ischemia but not always for ICH^{9,10}. The causes of nonhypertensive ICH include cerebral amyloid angiopathy, arterial or venous angiomas, brain tumors, anticoagulant medication, and bleeding tendency, such as leukemia, thrombocytopenia, and hemophilia. Although infectious diseases rarely cause ICH, they should not be ruled out. Some authors have reported ICH caused by schistosomiasis⁵, paragonimiasis⁶, or sparganosis⁷. We concluded that in our patient, ICH was associated with metagonimiasis although a definitive diagnosis of cerebral metagonimiasis was not made.

DM, a chronic metabolic disease, may be caused by intestinal parasitic diseases. Without aggravation of the disease, the clinical process of DM is similar to that of non-insulin-dependent diabetes. In our patient, optic fundus examination revealed mild proliferating retinopathy (**Fig. 1B**), which is a typical retinal change due to chronic diabetes. However, DM resolved several months after the complete resolution of metagonimiasis, and restriction of daily caloric intake was not required after treatment.

We emphasize that even though maintenance of hygienic environments has gained popularity in Japan, diagnosis of occult intestinal parasitic diseases

should be considered in patients with chronic metabolic diseases or atypical ICH.

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