EOSINOPHILIC MENINGITIS DUE TO *GNATHOSTOMA SPINIGERUM* IN A THAI IMMIGRANT IN SWEDEN

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Abstract. This is the first report from Sweden of eosinophilic meningitis due to *Gnathostoma spinigerum* in a 24-year old Thai immigrant. The patient presented with cutaneous symptoms several months before symptoms of meningitis develop. Both serum and cerebrospinal fluid gave strongly positive reactions to crude extract of *Gnathostoma spinigerum* infective larvae with a positive antigen-antibody band located at 24 kDa in Western blot analysis. After treatment with high doses of corticosteriods and albendazole, the patient recovered completely.

INTRODUCTION

Human gnathostomiasis is endemic in many parts of the world, especially in Southeast Asia (Daengsvang 1981; Nawa, 1991) and Latin America (Diaz Camacho *et al*, 1998). Only a few cases of gnathostomiasis in immigrants and tourists have been reported from Europe (Jelinek *et al*, 1994; Chandenier *et al*, 2001; Chappuis *et al*, 2001; del Giudice *et al*, 2001; Puente *et al*, 2002; Germann *et al*, 2003; Moore *et al*, 2003; Slevogt *et al*, 2003). The infection is contracted by eating raw freshwater fish and symptoms are due to migrating larvae. The most common manifestations are cutaneous symptoms, often accompanied by visceral symptoms (Sun, 1999; Bunnag, 2000). However, a more severe manifestation, eosinophilic myelomeningitis, with or without intracranial or intraspinal bleeding, can occur. Neurological sequalae are not uncommon. (Schmutzhard *et al*, 1988; Sun, 1999; Bunnag, 2000; Germann *et al*, 2003). This case report of eosinophilic meningitis due to *Gnathostoma spinigerum* in a 24-year old Thai immigrant is the first report of gnathostomiasis from Sweden and illustrates that awareness of this infection is low in Sweden and that it can be difficult to obtain a correct diagnosis.

CASE REPORT

A previously healthy, 24-year-old Thai woman from a province northeast of Bangkok on the Mekong river moved to Sweden in February 2002. In April the same year, she noted migratory, intermittent swellings and redness in several parts of her body, accompanied by pruritus without other symptoms. She did, however, not seek medical attention for this problem. In May, the patient noted a subcutaneous swelling on the right upper quadrant of her abdomen. She was treated with penicillin for a presumptive diagnosis of erysipelas and the local signs disappeared gradually. However, she did not feel quite well. In May, she presented with unilateral, cervical swelling and enlarged lymph nodes. She was then diagnosed with mononucleosis. Later the same month she was treated by a dentist with metronidazole because of an infection in a wisdom-tooth in the left mandible, where the lymph nodes were enlarged.

In August 2002, the patient was referred to the Department of Infectious Diseases with a 4-day history of headache, nausea, and pain in her left leg, but no fever. Blood chemistry was normal except for eosinophilia, 18% (2.8 x 10^9/l). Cerebrospinal fluid (CSF) showed 560 monocytes and 500 granulocytes x 10^6/l but normal glucose and albumin. The clinical presentation was similar to viral meningitis of neuroborreliosis, and she received doxycycline.

During treatment, she developed a periorbital edema and pseudotumor orbitae was suspected. Ophthalmologic investigation was normal. Computed tomography of the brain did not reveal any abnormalities and magnetic resonance imaging (MRI) only showed a slight increase in signals on the surface of the brain, of unclear significance. In the CSF, DNA from HHV-6, VZV, EBV, HSV type 1, HSV type 2 and CMV could not be detected. An HIV-test and Borrelia serology were negative. All cultures from blood and CSF were negative.

The clinical picture was not clear and due to eosinophilia of the peripheral blood, a helminthic

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infection like gnathostomiasis or angiostrongyliasis was suggested. The patient admitted that she had eaten salted fermented freshwater fish in Thailand. The incubation time was too long for angiostrongyliasis, but gnathostomiasis was possible.

A new lumbar puncture was performed a few days later, revealing 380 lymphocytes and 300 granulocytes x 10^6/l in the CSF. Almost all granulocytes were eosinophils. Cerebrospinal glucose and albumin were normal. In peripheral blood, she now had 29% eosinophils. We examined the CSF microscopically before and after centrifugation and could not find any helminths or larvae. A Giemsa stain was also done and was negative. She was treated with high doses of corticosteroids, the periorbital edema disappeared, and she improved.

To obtain an etiologic diagnosis, serum and CSF were sent to Bangkok for gnathostomiasis serology. Both serum and CSF gave strongly positive reactions to crude extract of *Gnathostoma spinigerum* infective larvae, with a positive antigen-antibody band located at 24 kDa in Western blot analysis (Tapchaisri *et al*, 1991). Both specimens also gave weak reactions to crude extract of young adult *Angiostrongylus cantonensis* (rodent lung worm). To exclude other parasitic causes of eosinophilic meningitis, serology against schistosomiasis, toxocariasis and trichinosis was performed but gave no evidence of infection with these agents.

When the diagnosis of gnathostomiasis was made in September, another lumbar puncture was performed. CSF was then normal with no pleocytosis, and eosinophilia in the peripheral blood was no longer present. MRI was normal. As she also had *Opisthorchis viverrini* eggs in stool specimens, albendazole was chosen as the concurrent treatment for both infections at a dosage of 400 mg b.i.d. for 3 weeks. The treatment with corticosteroids continued, but with lower doses.

In October 2002, the patient had recovered completely and took no medication at all. Blood chemistry was normal. Stool specimens for *Opisthorchis viverrini* were negative. In December, another lumbar puncture was performed. CSF was negative and only the serum was faintly positive for antibodies to *Gnathostoma spinigerum* larval antigen. At follow-up in March 2003, the patient was very well except for a very light pruritus after taking a bath. The skin was somewhat dry, which is common in Sweden during winter, due to the dry air in heated houses. No signs of gnathostomiasis were present. In October 2003, she was still well and had no signs of relapse.

DISCUSSION

Human gnathostomiasis can manifest as eosinophilic meningitis with neurological symptoms (Schmutzhard *et al*, 1988; Sun, 1999; Bunnag, 2002; Germann *et al*, 2003). This 24-year-old Thai immigrant in Sweden initially had cutaneous symptoms but gradually developed eosinophilic meningitis due to *Gnathostoma spinigerum.* Gnathostomiasis can be treated with either albendazole or ivermectin (Sun, 1999; Bunnag, 2000; Nontasut *et al*, 2000;Chappuis *et al*, 2001). For this patient, albendazole was chosen for specific anti-helmintic treatment, as she also had *Opisthorchis viverrini* eggs in stool specimens, so that both infections could be treated concurrently. In this case, high doses of corticosteroid were essential for alleviating cerebral symptoms and periorbital edema. After treatment, the patient recovered completely and had no relapse of gnathostomiasis one year later. Even though gnathostomiasis is not endemic to Sweden, the diagnosis should be considered in immigrants and tourists from endemic areas presenting with unclear symptoms. This case report illustrates that awareness of this disease is low in Sweden, despite increasing migration. There have also been reports from other European countries of delays in diagnosing this infection (Moore *et al*, 2003; Slevogt *et al*, 2003). If the diagnosis of gnathostomiasis had been considered earlier, many of the investigations and different medical treatments would not have been necessary.

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