A CASE OF ANAPHYLACTIC REACTION TO PRAZIQUANTEL TREATMENT

CHENGHUA SHEN, MIN-HO Choi, YOUNG MEE BAE, GUI YU, SHUHUA WANG, AND SUNG-TAE HONG*

Department of Parasitology and Tropical Medicine, and Institute of Endemic Diseases, Seoul National University College of Medicine, Seoul, Republic of Korea; Heilongjiang Provincial Zhaoyuan-xian Center for Disease Control and Prevention, Zhaoyuan, People’s Republic of China; Department of Internal Medicine, Heilongjiang Provincial Zhaoyuan People’s Hospital, Zhaoyuan, People’s Republic of China

Abstract. A 35-year-old Chinese man was administered praziquantel for clonorchiasis, and 30 minutes later he experienced a sudden onset of itching urticaria over his entire body with dyspnea, palpitation, and dizziness. The patient had no recent medication history except for the praziquantel. He was diagnosed as having an anaphylactic reaction with skin eruptions induced by praziquantel. His symptoms subsided after a stomach wash and the administration of antianaphylactic medication in emergency department of a regional hospital in the People’s Republic of China. The immediate type of hypersensitive reaction to praziquantel is plausible, and this reaction should be considered for praziquantel therapy.

INTRODUCTION

Praziquantel has been used comprehensively in both clinics and field as a broad-spectrum anthelmintic for the treatment of trematode or cestode infections. Although it is regarded as safe generally, the comprehensive use of praziquantel inevitably induces several common adverse reactions such as abdominal pain, diarrhea, dizziness, sleepiness, and headache.1 Most of these adverse reactions are transient and rapidly subside without specific treatment. In addition to these common adverse reactions, an anaphylactic reaction may occur but it is very rare and neglected usually. A search of the literature showed that two cases of anaphylactic shock have been attributed to praziquantel.2,3

The subject of the present report showed symptoms and signs of hypersensitivity such as hypotension and skin eruption after praziquantel medication for the treatment of clonorchiasis. We present the clinical findings for this subject.

CASE REPORT

A 35-year-old Chinese man, a laborer living at Zhaoyuan-xian, Heilongjiang Province, People’s Republic of China, was admitted to the Zhaoyuan People’s Hospital on March 28, 2005 complaining of symptoms of dizziness, pruritic urticaria, dyspnea, chest tightness, palpitation, and vomiting. The patient was healthy but had experienced epigastric fullness for a few weeks. He visited a clinic at the Zhaoyuan Center for Disease Control and Prevention, and was diagnosed as having clonorchiasis by detection of Clonorchis eggs through direct smear examination of stool. He was then prescribed praziquantel (1,200 mg three times a day for one day). He had been treated with Chinese praziquantel (Pyquiton®; Nanjing Pharmaceutical Co. Nanjing, People’s Republic of China) eight years earlier for clonorchiasis. He had ingested raw freshwater fish at home. On the morning of March 28, 2005, he took the first dose (two tablets) of praziquantel (Distocide®; Shin Poong Pharmaceutical Co. Ltd, Seoul, Republic of Korea) and 30 minutes later suddenly experienced the above-mentioned symptoms, which persisted for more than 10 minutes. Because of the seriousness of his symptoms, he was transferred to the Emergency Department of the Zhaoyuan People’s Hospital.

At the emergency department, he had an appearance of fainting. A physical examination showed a blood pressure of 50/30 mm of Hg, a weak rapid pulse of 99 beats per minute, respiratory rate of 28 per minute, a temperature of 36.5°C, and a weight of 70 kg. His breathing and heart beat sound were clear. He was conscious and could verbalize, and complained of itching, breathing difficulty, chest tightness, and dizziness. Urticaria affected his entire body, especially the chest, back, and abdomen, where it was severe and aggravated by scratching. Laboratory findings were as follows: white blood cell count = 19,100/mm³, hemoglobin level = 17.2 g/dL, platelet count = 184,000/μL, aspartate aminotransferase/alanine aminotransferase = 132/81 U/L, blood urea nitrogen = 54 mmol/L, creatinine = 76 μmol/L, Na = 142 mmol/L, K = 3.29 mmol/L, and Cl = 94.7 mmol/L. Tests results for hepatitis B surface antigen and antibodies to hepatitis B surface antigen, hepatitis B core antigen, and hepatitis C virus were negative. He was diagnosed as having an anaphylactic or hypersensitive reaction induced by praziquantel.

He received an emergent stomach wash by intubation, oxygen inhalation, injection of 0.5 mg of adrenaline hydrochloride, 20 mg of dexamethasone, and 25 mg of poromethazine hydrochloride intramuscularly, and an intravenous injection of 500 mL of 706 hydroxyethyl starch. One hour after receiving this medication, his blood pressure was 110/70 mm of Hg. One day after admission and medication, his symptoms of chest tightness and dyspnea subsided. After a two-day hospital stay, all of his vital signs were within normal ranges and symptoms had improved to the extent that he was discharged. He was advised to report this episode to doctors whenever he received further medication because of the possibility that he might also be hypersensitive to other drugs.

DISCUSSION

The present case report concerns a Chinese man who experienced an anaphylactic reaction and skin eruptions caused by praziquantel administered for treatment of clonorchiasis. The batch of praziquantel he received was produced in the normal manner by the Shin Poong Pharmaceutical Co. Ltd. (Seoul, Republic of Korea) in accordance with the a good
manufacturing practices protocol, and was administered before the expiration date. Approximately 20,000 residents have been treated with the same product in Heilongjiang Province, China over a five-year period (2000–2005), and this man is the only recorded case of a serious adverse reaction. Moreover, his clinical problem was not attributed to an adverse reaction triggered by an impurity or a conventional praziquantel side effect, but to a severe immediate-type hypersensitive or anaphylactic reaction. His clinical condition was characterized by a decrease in both systolic and diastolic blood pressure to as low as 50/30 mm of Hg, which could be regarded as a serious condition of shock. Fortunately, he obtained immediate appropriate treatment after the onset of symptoms. The patient recovered without sequelae soon after specific anti-anaphylactic therapy was administered.

Anaphylactic drug reactions of this type can be induced by any type of natural or synthetic drugs, but are rarely induced by praziquantel. Only two cases have been associated with praziquantel: one was a 46-year-old woman with chronic schistosomiasis in China, and the other was of a 10-year-old boy with neurocysticercosis in the United States. However, no cases have been recorded in Africa, where use of praziquantel consumption is the highest.

Neurocysticercosis and schistosomiasis are commonly associated with some serious adverse reactions to praziquantel. These serious reactions are known to be induced by exposure of the host to a large bolus of antigens and tissues released suddenly by dead worms. Dead worms in the brain or blood vessels are disintegrated and cleared from the tissue after treatment, and inevitably induce severe inflammation and strong antigenic stimulation. Treatment of cases with schistosomiasis mansoni increases specific IgE and Th2 responses. In particular, plasma levels of interleukin-5 were transiently increased in most patients with schistosomiasis one day after treatment, and these increases showed a correlation with infection intensity. In this context, anaphylaxis may be caused during treatment of schistosomiasis or neurocysticercosis per se by antigenic proteins released from eggs, teguments, and the cystic fluids of dead worms.

The anaphylactic reaction in this patient was not associated with tissue or immune reactions to dead worms but with praziquantel. Most dead worms of Clonorchis are discharged from the bile duct in the bile and feces within a few days of initiation of treatment and stop producing eggs or antigens. Animal experiments in our laboratory have repeatedly demonstrated that only a few dead worms are found in the lumen of the bile duct two weeks after the treatment. Although the dead worms still remain in the bile duct, their bodies are not disintegrated in the tissue but in the lumen of the bile duct. When the pharmacokinetics of praziquantel is considered, the plasma concentration of praziquantel increases to an effective level after one hour, and Clonorchis worms in the bile duct lumen are killed at least after two or more hours by this drug.

In the present case, however, the hypersensitivity symptoms suddenly appeared 30 minutes after the first dose of medication. Thirty minutes is the point at which praziquantel tablets dissolve and the beginning of absorption in the stomach or intestine. The time point is too early for the death of the worms. In this context, a sudden increase in antigenic stimulation caused by dead worms is not a burden to the host after treatment in the present case.

Praziquantel is known to cause several adverse reactions. The common adverse reactions are neurologic and digestive symptoms: neurologic symptoms are headache, dizziness, and sleepiness; digestive symptoms are abdominal discomfort, nausea, vomiting, and diarrhea. However, all of these symptoms are mild and transient, and require no specific therapy. Only an anaphylactic reaction requires hospitalization because this reaction is often associated with hypotensive shock and life-threatening airway obstruction caused by bronchospasm. The patient in this study complained of respiratory difficulties during the initial onset phase but his lung auscultation sounds were clear without wheezing or rale. At the emergency department, his respiration difficulty appeared only mild, and seemed to be an outcome of low blood pressure, not a bronchospasm. Moreover, laboratory data showed leukocytosis, which may have been related to the anaphylactic reaction.

The case in this study had a history of praziquantel administration eight years before the present episode. At that time, he took the drug without having an adverse reaction, and the previous administration of praziquantel may have sensitized him to the drug. He probably became reinfected after this treatment because he lived in an area endemic for clonorchiasis and enjoyed eating raw fish. There were no data for quantitative evaluation of the infection intensity, and he was not properly examined after this episode because of poor compliance. We recommend that he should be examined again, that egg counts be determined, and that he be retreated with albendazole instead of praziquantel.

Praziquantel causes anaphylactic type adverse reactions only on rare occasions. However, doctors and field workers should be aware of these reactions and the common adverse effects of praziquantel on memory.

Received September 14, 2006. Accepted for publication November 28, 2006.

Authors’ addresses: Chenguha Shen, Min-Ho Choi, Young Mee Bae, and Sung-Tae Hong, Department of Parasitology and Tropical Medicine, and Institute of Endemic Diseases, Seoul National University College of Medicine, Seoul 110-799, Republic of Korea. Gui Yu, Heilongjiang Provincial Zhaoyuan-xian Center for Disease Control and Prevention, Zhaoyuan 166500, People’s Republic of China. Shuhua Wang, Department of Internal Medicine, Heilongjiang Provincial Zhaoyuan People’s Hospital, Zhaoyuan, 166500, People’s Republic of China.

Reprint requests: Sung-Tae Hong, Department of Parasitology and Tropical Medicine, and Institute of Endemic Diseases, Seoul National University College of Medicine, Seoul 110-799, Republic of Korea.

REFERENCES

human T helper 2 cytokine responses to *Schistosoma mansoni* worm and worm-tegument antigens are induced by treatment with praziquantel. *J Infect Dis* 190: 835–842.

