Case Report

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A Case Report of Recurrent Cerebral Hydatid Cyst; Interaction between Phenytoin and Albendazole

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ABSTRACT

BACKGROUND AND OBJECTIVE: Hydatidosis is possible in all organs. However, brain involvement is only observed in only 1-2% of patients and is very rare. Common symptoms of brain involvement include headache, vomiting, seizures, behavioral disorders, or unilateral symptoms such as paralysis of one half of the body. Here we present a patient with cerebral hydatidosis that has recurred due to drug interactions between phenytoin and albendazole.

CASE REPORT: The patient is a 19 -year- old man with a history of cerebral hydatidosis who underwent two surgeries with complaints of generalized tonic-clonic seizures. CT scan of the brain showed a lobule cyst with internal septa in the right hemisphere of the brain with an adjacent lesion that has wall calcification, suggesting cerebral hydatidosis. To control the patient's seizures, sodium valproate was substituted for phenytoin and oral albendazole was recommended in consultation with the Infectious Diseases Service. The patient was discharged after five days in good general condition.

CONCLUSION: According to this case, concomitant use of anticonvulsant drugs including phenytoin, phenobarbital, and carbamazepine with albendazole has been reported to reduce plasma levels of albendazole and reduce its efficacy. Therefore, to control seizures in patients with cerebral hydatidosis treated with albendazole, it is better to use other anticonvulsant drugs.

KEY WORDS: *Seizures, Cerebral Hydatidosis, Albendazole, Phenytoin.*

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Introduction

Iran is one of the endemic regions for hydatid cysts. Among the 28 provinces studied in Iran, Khorasan and Yazd provinces have the highest and lowest rate of infection with this parasite, respectively (1). Involvement in all organs is possible, among which brain involvement is seen in only 1-2% of patients and is very rare (2). Patients with cerebral hydatidosis often have only one cyst, which is predominantly supratentorial and within the blood supply range of the middle cerebral artery (2).

Symptoms of hydatid cyst in the brain are related to the location and size of the cyst (3). More than 50% of patients with cerebral hydatidosis have more than one cyst in the brain (3). There are several assessment methods in these patients, among which brain CT scan is the first assessment method (4). Brain MRI is a complementary method of evaluating patients; in this imaging method, it is possible to examine details that are not seen in CT scan of the brain (4). Here we present a disease with cerebral hydatidosis that has recurred due to drug interactions between phenytoin and albendazole.

Case Report

This study has been approved in Mashhad University of Medical Sciences with the code of ethics IR.MUMS.REC.1399.268. The patient is a 19-year-old man from Tehran with a history of pulmonary and cerebral hydatid cysts. According to his mother, he underwent surgery twice for cerebral hydatidosis, once three years ago and the last time he had surgery was about three months ago. After the second operation and until regular visits, he was treated with albendazole and phenytoin tablets. From the last surgery until the morning of his visit, he did not have a seizure, but in the morning of his visit, he had three tonic-clonic seizures and for this reason he went to the emergency room.

At the time of the visit, the patient was fully conscious but complained about headaches. His vital signs at the time of his visit included a blood pressure of 110.70 mm Hg, a heart rate of 98 beats per minute, a respiratory rate of 18 beats per minute, and 95% oxygenation of the blood in the room. In laboratory tests, leukocytosis was 14,000 without eosinophilia and liver tests were normal. CT scan of the brain showed a lobule cyst with internal septa in the right hemisphere of the brain with an adjacent lesion with parietal calcification, altogether suggesting cerebral hydatidosis (Figure 1). MRI of the T2 shows a bilateral cyst with small cysts inside and wavy signals next to it, suggesting cerebral hydatidosis (Figure 2). The patient was admitted to the neurology service and to control the patient's seizures, sodium valproate was substituted for phenytoin. Following the consultation of the infectious service, the continuation of oral albendazole was recommended. The patient was discharged from the hospital after five days in good general condition and with the recommendation to follow up on an outpatient basis in a neurosurgery ward. No recurrence of the disease was observed in the one-year follow-up.

Figure 1. CT cross section of the brain showing a lobule cyst with internal septa in the right hemisphere and adjacent lesion with parietal calcification

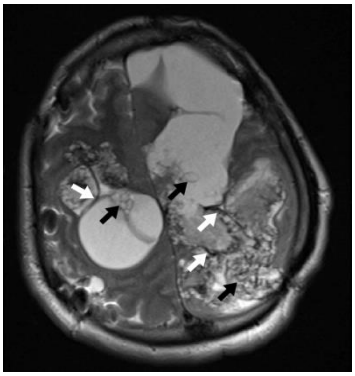

Figure 2. MRI of the brain in T2 view and cross section with bilateral cysts (black arrow) and wavy signal around them (white arrow)

Discussion

In previous cases of recurrence of hydatidosis, the patient has not taken albendarole regularly and this has caused the disease to recur. At a recent visit, he described his regular use of the drug, and said that because he had had a seizure in a previous relapse,

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phenytoin had been added to his treatment three months before his recent surgery. The appropriate drug treatment for cerebral hydatidosis after surgical removal of the cyst is oral mebendazole or albendazole, which is prescribed to adult patients at a dose of 400 mg twice daily to prevent cyst recurrence (5).

Albendazole is converted in the body to albendazole sulfoxide, the active form of the drug. Production of this active metabolite is influenced by hepatic cytochrome P450 (6). Anticonvulsants including phenytoin, phenobarbital, and carbamazepine inhibit the function of cytochrome P450. Concomitant use of anticonvulsant drugs including phenytoin, phenobabital, and carbamazepine with albendazole may result in drug interactions due to inhibition of cytochrome P450 and thus reduce the effective plasma level of albendazole (6). In the introduced patient, albendazole was prescribed after cyst resection to prevent recurrence of the cyst, but the patient was also treated with phenytoin due to a history of seizures. Due to the interaction of the two drugs and the reduction of the effective plasma level of albendazole, the recurrence of cysts can be due to the concomitant use of this drug.

In Croatia, Skuhala et al. diagnosed a patient with recurrent hydatidosis, which required repeated brain and even heart surgeries to treat the disease. They prescribed this patient for the last recurrence of the disease after surgery with a high dose of albendazole for 4 weeks with praziquantel for 2 weeks, and with this treatment the patient had a 3-year recovery (7). Our patient has had liver and brain problems and, according to him, he has not taken regular medication until his recent surgery. After surgery, he used the drug regularly, but due to the concomitant use of phenytoin, the interaction of this drug has reduced the effect of albendazole and the recurrence of the disease. In general, brain involvement with this parasite is rare and accounts for about 2% of brain space-occupying lesions, and 1-2% of patients with hydatid disease also have cerebral hydatidosis (8). In the study of Ghana et al., central nervous system involvement was reported in 1% of patients with hydatid disease (8). In a report by Cavusoglu et al. showed a 15-year-old boy with cerebral hydatidosis, who was presented with headache, nausea and vomiting, and symptoms of intracranial pressure and a giant hydatid cyst (9). Primary single hydatid cyst is the most common type of brain involvement and secondary cases of the disease often lead to multiple brain cysts or involvement of various organs in the body. Multiple hydatid cysts of the brain are rare and often occur due to spontaneous rupture of the primary cyst, or due to trauma or rupture during surgery of a single cyst, or secondary to rupture of the cyst anywhere in the body and embolic release of its larvae into the brain (5).

Our patient was presented with a generalized tonic-clonic seizure symptom. He had a history of complete resection of cerebral hydatidosis twice and did not have a history of cyst rupture during surgery or trauma. The standard effective treatment for cerebral hydatidosis is surgery and complete resection of the cyst without rupture (9). Concomitant use of anticonvulsant drugs including phenytoin, phenobarbital and carbamazepine with albendazole reduces the plasma level of albendazole and reduces its effect. Therefore, to control seizures in patients with cerebral hydatidosis treated with albendazole, it is better to use other anticonvulsant drugs to prevent this interaction. This may reduce side effects such as cyst recurrence.

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