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DICROCOELIUM DENDRITICUM INFECTION IN A PATIENT WITH CHRONIC SCHISTOSOMIASIS HAEMATOBIUM

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Abstract

Infection with *Dicrocoelium dendriticum* in humans is seldom to be reported in Egypt. This liver fluke, which commonly infects ruminants, has a complex life cycle with two intermediate hosts; the land snail and the ant. Human infection occurs by accidental ingestion of the second intermediate host. The present reported a patient suffered from recurrent acute chole-cystitis with chronic urinary schistosomiasis whose Kato stool examination showed *Dicroceolium dendriticum* eggs. He was successfully treated with Mirazid®

Keywords: Egypt, *Dicrocoelium dendriticum*, schistosomiasis, treatment.

Introduction

Dicrocoelium dendriticum or the lancet liver fluke is a parasite of the bile ducts & gall bladder of worldwide distribution among more than sixty mammalian hosts. However, the sheep, cattle, goats, deer, rabbits, equines, caprines and even dogs and cats other mammalians including man, but, spurious infection is the consequence of eating raw or undercooked animal liver; the eggs pass through the digestive tract unchanged (Burger *et al*, 2006). The human clinical symptoms of the true infection are neither uniform nor specific (Wilson, 1991).

This paper reported concomitant infection of *Dicrocoelium dendriticum* in a chronic schistosomiasis *haematobium* infected Egyptian old patient.

Patient, Materials and Method

A 62-year-old man from Beni-Sowif Governorate and he lived at Nag-Hammady City; Qena Governorate was referred for the laboratory examination. He suffered from chronic diarrhea with a copious of mucus in stool, and hematuria since 11 years with suspicion of bladder carcinoma after cystoscopy, another cystoscopy diagnose as a benign tumor, at 2009 he complained from vague abdominal pain and diagnosed as colonic stricture with benign tumor. Three years later he complained from repeated right hypochondria colicky pain and diagnosed as acute cholycysistis. He also complained from epigastric pain, upper endoscope was done and was diagnosed as gastritis.

Laboratory examination: CBC re-vealed eosinophilia, urine examination showed traces of bile acids and urinary tract infection and stool examination (Katz *et al*, 1970) revealed *Dicroceolium dendriticum* eggs. The patient was successfully treated with Mirazid® as two capsules on an empty stomach an hour before breakfast for seven successive days. After treatment, the patient was followed-up clinically and parasitological for one month.

Discussion

Mowlavi *et al*. (2015) stated that *D. dendriticum* spread together with sheep and goats westward throughout Europe from the Fertile Crescent during the 8000-6000year BC period and somewhat later southward into Africa, both spreads facilitated by the low specificity of that trematode species regarding the snail and ant intermediate hosts. In Egypt, Haridy *et al*. (2003) reported *D. dendriticum* in the sheep, goats and man in North Sinai Governorate. They added that infection is acquired by eating the second intermediate host (17 ants' species) with raw fruits, vegetables, herbs or even with the drinking water, and as to the first intermediate host, there was about 54 different species of land snails. They stated that in spite of the fact that the first and second intermediate hosts of *D. dendriticum* are available in Egypt, data about human and animal dicrocoeliasis was lacking.

Massoud *et al.* (2003) in North Sinai Gov-

ernorate successfully treated two dicrocoeliasis *dendriticum* butchers patients; one with Praziquantel® (25mg/kg three times daily after meals, for 4 successive days) and the second one with Mirazid® (2 capsules of 300mg daily an hour before breakfast, for six successive days) as indicated clinically and parasitological. Also, they successfully treated dicrocoeliasis imported sheep and two naturally infected local bred goats with Oleo-resin solution (6ml or 10gm% equivalent to 2 Mirazid capsules one hour before breakfast) orally once daily for 4 successive days, and cure was indicated by the stool examination and macroscopic examination of the animals when slaughtered. Haridy *et al.* (2006) in Tanta City (Gharbia Governorate) reported *D. dendreticum* in sheep 5/100 (5%), but neither dicrocoeliasis infection was in cattle or buffaloes. El-Shafie *et al*. (2011) in Giza Governorate reported zoonotic dicrocoeliasis *dendriticum* among a farmer's family and his domestic animals. The father and his wife were successfully treated with Triclabendazole® while the children and animals were successfully treated with Mirazid and Oleo-resin solution of *Commiphora molmol* respectively.

In the Arab Countries, dicrocoeliasis in man and/or animals was reported in Iraq (Wajdi and Nassir, 1983), Lebanon and Syria (Tohmé and Tohmé, 1977), Kuwait (Al Behbehani *et al,* 2003), Saudi Arabia (Abu Zinada, 1999; Omar *et al*, 1991; Helmy and Al Mathal, 2003; Al-Mathal and Fouad, 2004; Al-Megrin, 2010; Albogami *et al*, 2015), Somalia (Nødgaard and Kristensen, 1995) Sudan (Sabbatani and Fiorino, 2009) and Syria (Yenikomshian and Berberian, 1934).

Abroad, dicrocoeliasis was reported in the Canadian sympatric elk and beef cattle (Beck *et al*, 2014), in Côte d'Ivoire in the non-human primates (Kouassi *et al*, 2015), in Ghanaian school children (Ofori *et al*, 2015), in Indian goats (Godara *et al*, 2014), in Italian patients and the imported beef cattle (Stancampiano *et al*, 2007), in Japan *D. chinensis* was reported in Iwate prefecture (Ohtori *et al*, 2014), in Malaysian edible animals (Ran *et al*, 2015), in Switzerland, dicrocoeliasis was the most significant parasite of llamas and alpacas (Hilbe *et al*, 2015), in Turkish University students (Köksal *et al*, 2010) and in Turkish patients and garden snails (Köse *et al*, 2015). Hatam-Nahavandi *et al*. (2015) in Iran stated that in recent years, decreasing annual rainfalls in some countries and population growth forced to a shortage of freshwater resources. Also, the recycled wastewaters were suggested for agricultural activities. They investigated the occurrence of helminth eggs and protozoan cysts or oocysts in human and livestock wastewaters. They identified in urban treatment plants included hookworms, *Hymenolepis* & *Rhabditis* (or perhaps *Strongyloides*), *Entamoeba, Isospora, Giardia, Chilomastix* and *Cryptosporidium*, while in the slaughterhouses *Trichuris, Trichostrongylus, Moniezia, Dicrocoelium, Fasciola, Entamoeba, Cryptosporidium, Eimeria* and *Giardia* were isolated. They concluded that the efficacy of removal of nematode eggs, and not protozoan infective stages, in the urban wastewater treatment plants, was in compliance with the WHO parasitological guideline (<1 nematode/liter) required for unrestricted irrigation.

Generally speaking, *D. dendriticum* with *D. hospes* as being long and narrow, are generally confined to the more distal parts of the bile ducts. As a result most *D. dendriticum* infections of the biliary tree produce only mild symptoms. In the initial stages, there is leukocytosis, eosinophilia and traces of bile acids in the urine. On the more infection, slight anemia may ensue, the leukocytosis drops to normal level and eosinophila decreased to 5%-7% (Rosicky and Groschaft, 1982). Manga-González *et al*. (2004) reported significant increases in the hepatic enzyme activity as a pathogenic response to the dicrocoeliasis invasion that produced host-toxic metabolites. Usually, the dicrocoeliasis is accompanied by either a prolonged period of constipation or diarrhea, nausea and vomiting. Sometimes, the patients may complain of abdominal dis-

comfort and pain in the right half of the abdomen and in the epigastrium radiating to the right shoulder and chronic watery diarrhea with slight elevation of liver function tests. In heavier infections, the bile ducts and biliary epithelium may become enlarged in addition to the generation of fibrous tissue surrounding the ducts causing an enlarged liver (hepatomegaly) or inflammation of the liver cirrhosis (Cengiz *et al*, 2010). In one unique case, *D. dendriticum* was associated with a skin rash urticaria (Sing *et al*, 2008).

Moreover, Khalil *et al*. (2013) stated that *D. dendriticum*, rather than *Linguatula serrata* or *Fasciola hepatica*, as the prime suspect in the pathogenesis of Lebanese people, halzoun syndrome. Hilbe *et al*. (2015) reported that liver flukes can induce proliferative changes in lung arteries in New World Camelids that resemble those seen with pulmonary arterial hypertension caused by human liver parasites. But, the degree of liver fluke infection was not correlated with the extent of liver damage, or with the amount of thoracic or abdominal effusion or pulmonary arterial changes. Pepe *et al*. (2015) studied the effects of *D. dendriticum* on cell proliferation, cell death mechanisms and oxidative stress induction was evaluated in hepatocellular carcinoma (HCC) cell lines (HepG2 & HuH7) and found that the occurrence of an escape anti-apoptotic mechanism in HCC cells. They concluded that the role for *D. dendriticum* in the chronic oxidative stress and in the regulation of transformation processes in hepatic cell carcinoma warranting. Current public health prevention strategies have involved the condemnation of contaminated livers so as to eliminate any possibility for the food-borne infection (CDC, 2013).

Conclusion

Undoubtedly, the pathogenesis of dicrocoeliasis worldwide is more than was previously considered. The zoonotic dicrocoeliasis transmission could occur through the sheep, buffalo, rabbits, equines and/or even dogs and cats. Also, the imported beef must be inspected. Besides, the health care workers should keep in mind zoonotic parasitoids especially the rarely encountered dicrocoeliasis.

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