Review Article

Helminthic infections mimicking malignancy: a review of published case reports

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Abstract

Background: Infectious diseases, including infections with helminths, can initially present similarly to malignancies. The goal of the article is to review reports of helminthic infections that are initially diagnosed as malignancy.

Methodology: The database PubMed was searched for English language references published as of July 2009.

Results: The following published case reports and case series, mainly from Asia and Africa, were identified: Nematodes: 8 publications (1 patient with Angiostrongylus cantonensis, 2 Strongyloides stercoralis, 1 Toxocara species, 1 Dioctophyma renale, 1 Ascaris species, 1 Gnathostoma spinigerum, 1 Dirofilaria repens); Trematodes: 7 publications (46 patients with Schistosoma species, 2 Fasciola hepatica, 1 Paragonimus westermani); Cestodes: 6 publications (10 patients with Echinococcus species, 1 Sparganum mansoni).

Conclusion: To avoid unnecessary investigations and treatment, physicians should be aware when diagnosing patients from Asia or Africa that a large number of helminthic infections can present similar to malignancies.

Key words: Helminths, malignancy, misdiagnosis


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Introduction

Infectious diseases can have an initial presentation similar to that of malignancy. For example, infection with Actinomyces species bacteria causes infiltrative tissue growth similar to that seen in lung cancer, pelvic tumor, or colon cancer [1]; protozoal disease, e.g. with Entamoeba histolytica, can involve the colon and cause ulceration of the mucosa similar to carcinoma [2]; viral infection with Epstein-Barr virus can cause proliferation of lymphocytes similar to T-cell leukemia [3]; and fungal infection with Cryptococcus gattii can cause lesions similar to those of lung and brain cancer [4]. Familiarity with infections presenting with features similar to malignancy is useful because infections initially diagnosed as malignancy and then managed and treated accordingly, can lead to unnecessary interventions, including invasive procedures. Infections, however, are effectively treated with antibiotics and early diagnosis will be beneficial. Therefore, this article focuses on helminthic infections and reviews published case reports of helminthic infections which were initially considered to be malignancies.

Materials and methods

PubMed was searched for English language references published as of July 2009 using different combinations of the following terms: “helminth”, “nematode”, “trematode”, “cestode”, “malignancy”, “mimicking”, “misdiagnosis”. Spelling variants of the search terms were included. Reports of patients with the final diagnosis of infection with helminths, but where the cause of the disease was initially considered to be malignancy, were included in the study. Reports describing infections (e.g. Opisthorchis species and Clonorchis species) with coexisting malignancy were excluded.

Results

This review identified 21 published reports of helminthic infections, describing in total 68 patients, which were initially considered to be malignancies (Table 1).
Table 1. Summary of published reports of patients with helminthic infection, which were initially considered to be malignancies.

<table>
<thead>
<tr>
<th>Malignancy</th>
<th>Infection</th>
<th>Location</th>
<th>Diagnostic study</th>
<th>Patient details*</th>
<th>Management</th>
<th>Duration of symptoms*</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nematodes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spinal cord tumor(15)</td>
<td><em>Angiostrongylus cantonensis</em></td>
<td>Spinal cord (T7-T10)</td>
<td>Histology</td>
<td>26, male, Thailand</td>
<td>Resection</td>
<td>6 months</td>
<td>Unknown</td>
</tr>
<tr>
<td>Lung cancer(16)</td>
<td><em>Stronglyloides stercorealis</em></td>
<td>Lung</td>
<td>Cytology</td>
<td>79, male, Spain</td>
<td>Thiabendazole</td>
<td>1 week</td>
<td>Death</td>
</tr>
<tr>
<td>Duodenum adenocarcinoma(17)</td>
<td><em>Stronglyloides stercorealis</em></td>
<td>Duodenum</td>
<td>Histology</td>
<td>40, female, Iran</td>
<td>Thiabendazole</td>
<td>10 years</td>
<td>Death (2 days)</td>
</tr>
<tr>
<td>Disseminated tumor(18)</td>
<td><em>Toxocara species</em></td>
<td>Liver, lung, spinal cord Past medical history of retinoblastoma</td>
<td>Serology</td>
<td>4, male, Canada</td>
<td>Albendazole Prednisone</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td>Retroperitoneal mass(19)</td>
<td><em>Dioctophyma renale</em></td>
<td>Retroperitoneum</td>
<td>Histology</td>
<td>50, male, China</td>
<td>Resection</td>
<td>4 weeks</td>
<td>Unknown</td>
</tr>
<tr>
<td>Liver metastasis(20)</td>
<td><em>Ascaris species</em></td>
<td>Past medical history of malignant melanoma</td>
<td>Histology</td>
<td>40, male, Germany</td>
<td>Liver resection</td>
<td>NA</td>
<td>Unknown</td>
</tr>
<tr>
<td>Spinal cord tumor(21)</td>
<td><em>Gnathostoma spinigerum</em></td>
<td>Cervical and thoracic spine</td>
<td>Histology</td>
<td>4, male, Thailand</td>
<td>Albendazole Metronidazole</td>
<td>2 weeks</td>
<td>Improved</td>
</tr>
<tr>
<td>Scrotal tumor(22)</td>
<td><em>Dirofilaria repens</em></td>
<td>Scrotum</td>
<td>Histology, Serology</td>
<td>28, male, Tunisia</td>
<td>Excision</td>
<td>3 weeks</td>
<td>Unknown</td>
</tr>
<tr>
<td><strong>Trematodes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cervical cancer(5)</td>
<td><em>Schistosoma species</em></td>
<td>Cervix</td>
<td>Histology</td>
<td>40 patients, Tanzania</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td>Spinal cord tumor(10)</td>
<td><em>Schistosoma mansoni</em></td>
<td>Thoracic spinal cord</td>
<td>Serology History</td>
<td>46, male, Brazil</td>
<td>Praziquantel</td>
<td>1 year</td>
<td>Improved symptoms</td>
</tr>
<tr>
<td>Spinal cord tumor(11)</td>
<td><em>Schistosoma mansoni</em></td>
<td>Spinal cord T7 – T11</td>
<td>Histology Stool</td>
<td>6, female, Sierra Leone</td>
<td>Praziquantel</td>
<td>2 days</td>
<td>Walking with braces (6 months)</td>
</tr>
<tr>
<td>Brain tumor(6)</td>
<td><em>Schistosoma species</em></td>
<td>Dura mater</td>
<td>Histology</td>
<td>21, female, Brazil</td>
<td>Oxamniquine Resection</td>
<td>3 months</td>
<td>Unknown</td>
</tr>
<tr>
<td>As above</td>
<td><em>Schistosoma mansoni</em></td>
<td>Cerebellum</td>
<td>Histology Stool</td>
<td>31, male, Brazil</td>
<td>Oxamniquine Resection</td>
<td>1 month</td>
<td>Unknown</td>
</tr>
<tr>
<td>As above</td>
<td><em>Schistosoma species</em></td>
<td>Cerebellum</td>
<td>Histology</td>
<td>11, male, Brazil</td>
<td>Oxamniquine Dexamethasone Resection</td>
<td>3 months</td>
<td>Recovered</td>
</tr>
<tr>
<td>As above</td>
<td><em>Schistosoma mansoni</em></td>
<td>Frontal lobe and thalamus</td>
<td>Histology Stool</td>
<td>38, male, Brazil</td>
<td>Praziquantel Prednisone</td>
<td>3 months</td>
<td>Unknown</td>
</tr>
<tr>
<td>Colon tumor(23)</td>
<td><em>Fasciola hepatica</em></td>
<td>Colon</td>
<td>Histology, Serology</td>
<td>55, male, Turkey</td>
<td>Bithionol</td>
<td>1 year</td>
<td>Stable (1 year)</td>
</tr>
<tr>
<td>Peritoneal carcinomatosis(24)</td>
<td><em>Fasciola hepatica</em></td>
<td>Peritoneum</td>
<td>Histology, Serology</td>
<td>37, male, France</td>
<td>Praziquantel, triclabendazole</td>
<td>7 months</td>
<td>“favorable”</td>
</tr>
<tr>
<td>Lung cancer(25)</td>
<td><em>Paragonimus westermanii</em></td>
<td>Lung</td>
<td>Histology</td>
<td>66, female, Japan</td>
<td>Praziquantel Resection</td>
<td>3 months</td>
<td>Stable (21 days)</td>
</tr>
</tbody>
</table>
Nematodes

Eight reports of patient case histories with infections with nematodes, which were initially considered to be malignancy, were identified (one patient with Angiostrongylus cantonensis infection, two Strongyloides stercoralis, one Toxocara species, one Diocophyma renale, one Ascaris species, one Gnathostoma spinigerum, one Dirofilaria repens) (Table 1). Seven infections were diagnosed based on histology or cytology and one infection based on serology. The average age of the reported patients was 33.8 years (range 4-79 years). The duration of symptoms before diagnosis was between one week and 10 years. Four patients were treated with medication and 4 patients were treated with resection. Four patients were from Asia, two from Europe, one from Africa, and one from North America.

Trematodes

Seven reports of patient case histories with infections with trematodes, which were initially considered to be malignancy, were identified (46 patients with Schistosoma sp. infection, two Fasciola hepatica, one Paragonimus westermani. One report [5] included 40 patients and one report [6] included four patients. In all reports, histology or cytology of lesions was used for diagnosis. The average age of reported patients was 38.8 years (range 4-66 years (Swai et al. [5] excluded). All were treated with drug therapy. Four patients had a tumor resected. The duration of symptoms before diagnosis was between two days and one year. Forty-one patients were from Africa and five from South America. One autochthonic patient was from Europe and two were from Asia. One report [5] described 40 patients with Schistosoma sp. infection of the cervix, who were initially considered to have cervical cancer. The other reported patients with Schistosoma species infection were initially considered to have malignancies of the spinal cord (two case reports [10,11]) or brain (four case reports [6]) (Table 1).

Cestodes

Six reports of patient case histories of infections with cestodes which were initially considered to be malignancy were identified (10 patients with Echinococcus sp. infection, one with Sparganum mansoni; one report [7] included five patients and one report [8] included two patients). In all reports histology or cytology of lesions was used for diagnosis. The average age of reported patients was 33.8 years (range 22-75 years). Eight Patients were
treated with drugs, two with hypertonic saline solution irrigation, and two had resection only. The duration of symptoms before diagnosis was between two months and eight years. All reports were from Asia including four reports of nine patient case histories from Turkey.

Discussion

The infections most frequently reported were infections with Schistosoma species (46; 68% cases) and Echinococcus species (10; 15% cases), and all were initially considered to be cancer. Patients with Schistosoma species infection were from Africa and South America and patients with Echinococcus species infection were from Asia.

Providing clinicians with related information may be useful and an online database for infections presenting similar to malignancy could be developed comparable to OMIM (Online Mendelian Inheritance in Man) of the National Center for Biotechnology Information [9]. For example, clinical data of patients from Africa or South America with spinal tumors caused by Schistosoma species granuloma similar to the cases describe by Camargos et al. [10] or Selwa et al. [11], as shown in Table 1, could be collected in the database. Users would enter search terms such as “spinal tumor” and “Africa” and receive in return reports of infections presenting similar to spinal tumor including infections with Schistosoma species. Echinococcus species infections in patients from Asia, which can present similarly to liver and lung malignancy [7,8,12-14] (Table 1), could also be included in a database, to suggest to clinicians searching terms such as “lung tumor” and “Asia” the possibility of infection in patients from Europe and Asia presenting with apparent liver and lung malignancy.

Based on the reported cases in this review, it could not be determined whether earlier recognition of a parasite infection, which can be treated with antibiotics, can improve morbidity and mortality. However, diagnosis of helminthic infection was reported for some patients [6,20,23] based on histology studies from tissue samples obtained during surgery for perceived malignancy. Invasive procedures and investigations can probably be avoided in some cases by considering helminthic infections early.

In summary, this review identified published reports of helminthic infections presenting similarly to malignancy. Familiarity with this presentation may help clinicians to come to timelier diagnoses of treatable infections when seeing patients with apparent cancer and avoid unnecessary tests and treatment. Clinicians may benefit from access to an online database for reports of infections presenting similarly to malignancy when seeing patients from Asia and Africa with apparent malignancy.

References


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