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section 8 Infectious diseases 1438 Polymerase chain reaction assays have been able to identify infec- tions that were negative by traditional stool microscopy. Treatment and prognosis The drug of choice for the treatment of C. belli-induced diarrhoea C. belli is oral co-trimoxazole (TMP-SMX). There are no docu- mented reports of drug resistant infections. A dose of TMP 160 mg- SMX 800 mg 2–4 times a day for 10–14 days results in rapid (within 2–3 days) clearance of parasites and diarrhoea. In patients with HIV- 1 infection and CD4+ cell counts less than 200 cells/µl secondary prophylaxis with TMX 320 mg/SMX 1600 mg once daily or three times a week prevents relapses. In general, secondary prophylaxis can be stopped if the CD4+ count exceeds 200/µl; however, there are case reports of chronic infection with relapse still occurring despite patients have CD4+ counts above 200/µl and having re- ceived primary therapy with TMP/SMX. In patients unable to tol- erate sulfonamides due to allergy or intolerance there is no standard treatment. Pyrimethamine has been used for both treatment and secondary prophylaxis in patients with AIDS and sulfa allergy with success. When pyrimethamine is administered it should be given with folinic acid (5–10 mg/day) to minimize bone marrow suppres- sion. Ciprofloxacin can be used as an alternative treatment, although it is less effective than either TMP/SMX or pyrimethamine. In a ran- domized study of 22 patients with cystoisosporiasis and HIV infec- tion, 10/10 patients on TMP/SMX had cessation of diarrhoea within 2 days and 10/12 on ciprofloxacin (500 mg BID) had a cessation of diarrhoea within 4.5 days. All three patients who had persistent C. belli oocysts in their stools responded to treatment with TMP/ SMX with clearance of the parasite. In patients who responded to ciprofloxacin continued prophylaxis with ciprofloxacin prevented recurrence of disease. Nitazoxanide has also been used to treat C. belli infections. Two patients on 500 mg nitazoxanide twice daily for 3 days were oocyst negative after treatment; a patient treated with 500 mg nitazoxanide twice daily for 7 days became oocyst negative by day 14 after treatment. FURTHER READING Boyles TH, et al. (2012). Failure to eradicate Isospora belli diarrhoea despite immune reconstitution in adults with HIV—a case series. PLoS One, 7, e42844. Field AS (2002). Light microscopic and electron microscopic diagnosis of gastrointestinal opportunistic infections in HIV-positive patients. Pathology, 34, 21–35. Fox LM, Saravolatz LD (2005). Nitazoxanide: a new thiazolide antiparasitic agent. Clin Infect Dis, 40, 1173–80. Lindsay DS, et al. (1997). Examination of extraintestinal tissue

cysts of Isospora belli. J Parasitol, 83, 620–5. Pape JW, Verdier RI, Johnson WD Jr (1989). Treatment and prophy- laxis of Isospora belli infections in patients with the acquired im- munodeficiency syndrome. New Eng J Med, 320, 1044–7. Weiss LM, et al. (1988). Isospora belli infection: treatment with pyri- methamine. Ann Int Med, 109, 474–5. Verdier RI, et al. (2000). Trimethoprim-sulfamethoxazole compared with ciprofloxacin for treatment and prophylaxis of Isospora belli and Cyclospora cayetanensis infection in HIV-infected patients—a randomized, controlled trial. Ann Int Med, 132, 885–8. 8.8.8 Sarcocystosis (sarcosporidiosis) John E. Cooper ESSENTIALS Sarcocystosis is characterized by the invasion of various tissues by protozoa of the genus Sarcocystis. S. hominis (intermediate host domestic cattle) and S. suihominis (domestic pig) are the most significant to humans, to whom they are transmitted by ingestion of uncooked beef or pork. Camel meat can be a significant source of S. cameli in Arabia. Humans and other primates serve as either intermediate or final host: (1) inter- mediate host—presence of cysts in muscle is usually asymptomatic, but might cause myositis or myopathy; detected on clinical examination or muscle biopsy; (2) final host—can be asymptomatic or cause fever and gastrointestinal upset; oocysts or sporocysts can be detected in faeces. There is no specific treatment. Prevention is by not eating uncooked meat from any animal and by improving food hygiene in poorer countries. Introduction Although often described as uncommon in humans, sarcocystosis ap- pears to be widespread but undetected. The causal organism is a proto- zoon that was first described in a deer-mouse in Switzerland in 1843 but the life cycle of which was not determined until 1972. Over the succeeding four decades there has been growing interest in the para- site. In 2015 the first Sarocystis genome was elucidated. Sarcocystis is considered part of the Apicomplexa phylum, along with Eimeria species such as Toxoplasma gondii. It has been reported from most continents, but the exact distribution of the different species remains uncertain, largely on account of the absence of definitive clinical signs in many cases. Sarcocystosis is one of the most prevalent infections of endothermic and ectothermic animals throughout the world. In 2011, 9 travellers who had stayed on an island in Malaysia presented in Germany 4–41 days later with fever, pruritus, myalgia, fatigue, nausea, and headache. Laboratory abnormalities included eosino- philia (15–20%) and mildly elevated serum creatine kinase concen- trations. Muscle biopsies demonstrated sarcocystis-like bradyzoites. Over the past decade, veterinary studies, especially serological sur- veys, have indicated that Sarcocystis species are present in a wide range of domesticated and wild mammals and other animals, often at a high prevalence (Fig. 8.8.8.1). Snakes and their rodent prey are definitive and intermediate hosts for many species of Sarcocystis; there is evidence of coevolution of the parasites with their vertebrate hosts. Equine protozoal myeloencephalitis, a highly fatal disease of domestic horses due to S. neurona—and characterized by the presence of schiz- onts in neural cells—has prompted a considerable body of research on Sarcocystis in recent years because of its economic importance. Sarcocystosis presents both actual and perceived public health problems. Some species, such as S. hominis and S. suihominis, can be transferred from animals to humans but others, while often causing alarm among those who encounter them, do not appear to be Acknowledgement: I am most grateful to Dr Sarah Cooper for reading and com- menting on an early version of this chapter.

 transmissible. For example, S. rileyi, which commonly affects ducks and geese in North America, presents with readily visible cream- coloured cysts generally running in parallel lines in the muscles of affected birds. This condition, often termed ‘rice breast disease’, is fa- miliar to hunters and to those who skin waterfowl before they are cooked. Many affected carcasses are discarded, but meat containing the cysts presents no known hazard to people who eat it. More re- cently S. nesbitti has been identified as infecting humans, as inter-

mediate hosts, probably after consuming contaminated water or food. This species usually has reptiles, such as snakes, as the final host. The role of host resistance in sarcocystosis has not, however, been extensively studied and it is possible that reduced host resistance might render humans susceptible to species of Sarcocystis that are pri- marily parasites of wild birds, reptiles, or mammals. In nonhuman primates, immunodeficiency does appear to be a predisposing factor. Clinical features Humans as the final host Depending on the species of parasite and the previous health of the host, infection might cause symptoms. Humans who have ingested raw or undercooked pork or beef containing mature sarcocysts of Sarcocystis can be considered final hosts. Infection can have effects that range from gastrointestinal symptoms, pyrexia, and hypersensi- tivity-like clinical signs to an asymptomatic state. Humans as the intermediate host Sometimes humans ingest sarcocysts from other species and become ab- errant intermediate hosts. In these circumstances the presence of cysts in human skeletal, visceral, or cardiac muscle is usually not associated with symptoms or clinical signs. However, it is likely that large numbers of cysts might, as in the definitive host animals, cause myositis or myop- athy, especially if calcification occurs, sometimes with vasculitis. Diagnosis Humans as the final host Oocysts or sporocysts can be detected in faeces in smears (especially using Heine’s method), in wet saline preparations, or, better, using a so- dium chloride or sucrose flotation method (Fig. 8.8.8.2). The oocysts/ sporocysts, measuring about 10 by 15um, are usually readily recognized by an experienced parasitologist but can easily escape the attention of those who are less familiar with the organism. Sarcocystis must be dis- tinguished from other sporozoal organisms that are either being pro- duced in the intestine or are in transit in the lumen following ingestion. Humans as the intermediate host Occasionally, tissue cysts are detected during routine clinical examin- ation, especially if calcification has occurred. They might also be seen in muscle biopsies, either as an incidental finding or because samples have been taken specifically for diagnostic purposes. Calcified cysts found in biopsies or located at autopsy have a gritty texture when cut. Sarcocystosis of muscle (Figs. 8.8.8.1 and 8.8.8.3) must be differ- entiated from toxoplasmosis, in which tissue cysts can also be found. The morphology of the two protozoa differs. In particular, cysts of Sarcocystis have a distinct wall, which is thick and striated in some species, and do not stain with periodic acid–Schiff stain, which usu- ally gives Toxoplasma cysts a magenta colour. (a) (b)
Fig. 8.8.8.1 Sarcocystis in skeletal muscle of a little penguin Eudyptula minor (haematoxylin and eosin). Courtesy of Dr Richard Norman. Fig. 8.8.8.2 Sporocyst containing sporozoites in faeces of a fox Vulpes vulpes. There are two within the oocyst when freshly passed but single sporocysts are often seen. Courtesy of Dr John McGarry.

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