



Drug of Choice in The Treatment of Intestinal Protozoa Infection in Indonesia

Pilihan Obat Dalam Tata Laksana Infeksi Protozoa Usus di Indonesia

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ABSTRACT

Protozoal infections are still reported to be widespread in several regions around the world, especially in areas with subtropical and tropical climates, where the environment is poor in hygiene. This disease is endemic in several areas in Indonesia, both on the island of Java and outside, especially in rural areas. So far, the treatment of protozoal infections still relies on nitroimidazole antibiotics. However, there are a number of reports of resistance and treatment failure with these antibiotics. In Indonesia, there are still few articles that discuss the treatment of parasitic infections. The purpose of writing this article is to review the therapeutic options that can be used in the management of protozoal infections in Indonesia. From this review, it can be concluded that in addition to the nitroimidazole group, clefamide, amphotericin-B, oxytetracycline, trimetoprim-sulfamethoxazole, paramomycin, and nitazoxanide can also be used as alternative treatments.

Keywords : protozoal infection; medication; drug of choice

ABSTRAK

Infeksi protozoa masih dilaporkan tersebar luas di beberapa wilayah di seluruh dunia, khususnya di area dengan iklim subtropis dan tropis, dimana lingkungannya memiliki higienitas yang buruk. Penyakit ini menjadi endemi di beberapa daerah di Indonesia, baik di pulau Jawa maupun di luar, terutama di area pedesaan. Pengobatan infeksi protozoa sejauh ini masih mengandalkan antibiotik golongan nitroimidazole. Meski demikian, terdapat sejumlah laporan mengenai resistensi dan kegagalan pengobatan dengan antibiotik tersebut. Di Indonesia, masih sedikit artikel yang membahas mengenai pengobatan infeksi parasit. Tujuan dari penulisan artikel ini adalah untuk meninjau pilihan terapi yang dapat digunakan dalam tata laksana infeksi protozoa di Indonesia. Dari tinjauan tersebut, dapat disimpulkan bahwa selain golongan nitroimidazole, dapat pula clefamide, amfoterisin-B, oksitetrasiklin, trimetoprim-sulfametoxazole, paramomycin, dan nitazoxanide dijadikan sebagai alternatif pengobatan.

Kata kunci : infeksi protozoa; pengobatan; tata laksana.

INTRODUCTION

Intestinal protozoa are spread through the fecal-oral route, most commonly through the ingestion of contaminated water or food. It can also be spread through person-to-person or, less commonly, animal-to-person. Individuals with a sub-clinical disease can serve as carriers and may infect others. Within the United States, populations at risk include international travelers, wilderness travelers, daycare workers, men who have sex with men, and professions with contact with human waste. (Coffey et al, 2021)

Protozoal infections are widely reported from various regions around the world, especially tropical and subtropical areas where the environment is poor hygiene. This disease is endemic in Indonesia, both outside Java and on the island of Java, especially in rural areas. In South Kalimantan 12% of the stools examined showed the presence of *Entamoeba histolytica* while in Medan 6.25% of diarrhea patients were amoebic dysentery. In the Seribu Islands area, Jakarta, 5% of the feces of primary school children examined showed the presence of this intestinal protozoan. (Chacon, 2016)

Giardia lamblia is distributed cosmopolitanly in tropical and subtropical regions. The current epidemic of giardiasis is a health problem in America and other developed countries because it is a New Emerging Disease. The high number of AIDS/HIV sufferers in countries causes the number of patients with clinical giardiasis to greatly increase due to the low immunity of the patient. Research in 2004 showed the prevalence of *Giardia lamblia* in Indonesia was 3.62%, while of children suffering from diarrhea in Malang, 1.2% of them were caused by these protozoa. (Budiani, 2016)

So far, the treatment of protozoal infections still relies on nitroimidazole antibiotics. However, there are a number of reports of resistance and treatment failure with these antibiotics. In Indonesia, there are still few articles that discuss the treatment of parasitic infections. The purpose of writing this article is to review the therapeutic options that can be used in the management of protozoal infections in Indonesia.

NITROIMIDAZOLE

Metronidazole

Metronidazole for giardiasis in an adult dose of 3 x 250 mg a day is given for 5 days or 2 grams a day for 3 days. The dose for children is 3x5 mg/kg body weight given for 5 days. Nitazoxanide for giardiasis is given to adults at a dose of 2x500 mg for 3 days, Children's dose: 1-3 years old 2x100 mg for 3 days, 4-11 years old: 2x200 mg for 3 days. (Iza et al, 2019)

This amoebicide is the drug of choice for treating intestinal and liver amebiasis. For mild or moderate intestinal amebiasis, the adult dose given is 3 times 500-750 mg per day for 7-10 days, while for pediatric patients, metronidazole is given at a dose of 35-50 mg per kilogram of body weight per day divided into 3 doses, given for 7-10 days. To treat liver amebiasis and severe intestinal amebiasis, in addition to the doses above, metronidazole is given at an adult dose of 3x750 mg/day given for 7-10 days, while in children, metronidazole is given at a dose of 35-50 mg per kilogram of body weight per day divided into 3 doses, which are given for 7-10 days. (Gaffar, 2014)

Metronidazole is the drug of choice that can be given in different doses for trichomoniasis for women and men. In female patients, the drug is given 2x500 mg per day for 7 days or 2 grams in a single dose given at night. The child's dose is 15 mg/kg body weight per day divided into 3 drinking doses. For local treatment metronidazole can be given in the form of vaginal tablets at a dose of 500 mg per day for 10 days. For male patients, the drug is given 2x250 mg per day for 10 days or 2 grams in a single dose given at night. (Sodeman, 2011)

Blastocystis infection can be treated with metronidazole at a dose of 3 x 750 mg per day for 10 days, iodoquinoline at a dose of 3 x 650 mg per day for 20 days or trimethoprim-sulfamethoxazole at a dose of 2 x 1 tablet per day for 7 days. To prevent fecal-oral transmission, the food or drink to be consumed must be cooked properly. In addition, contamination of water sources by feces must be prevented and personal and environmental hygiene must always be maintained. (John, 2013)

Fasigyn (Tinidazole)

Tinidazole is given as a single dose of 2 grams per day for 3 days to treat intestinal amebiasis, and is given for 5 days to treat hepatic or other extraintestinal amebiasis. For adults it is given at a dose of 2 grams per day, while the dose for children is 50-60 mg per kilogram of body weight (maximum 2 grams) per day, for 3 days. (Corry, 2014)

Tinidazole for trichomoniasis is given orally with a single dose of 2 grams for adults, while a single dose for children is 50 mg/kg body weight, maximum 2 grams. Secnidazole is given orally in a dose of 2 g as a single dose. (MacLean, 2017)

Naxogin (Nimorazole)

To treat intestinal amebiasis nimorazole is given for 5 days. The dose for adults is 2 grams per day, while the dose for children is 30-40 mg per kilogram of body weight per day. To treat liver amebiasis, nimorazole is given at the same dose for intestinal amebiasis given for 10 days. Nimorazole is given in a dose of 2x250 mg for 6 days or given 2 grams in a single dose; and Ornidazole (Tiberol) given in a dose of 2x750 mg or a single dose of 1500 mg. (Chacon, 2016)

AMPHOTERICIN-B

To treat meningoencephalitis caused by amoeba, amphotericin-B can be given intravenously, intrathecally or intraventricularly. This drug can reduce mortality from *Naegleria fowleri* infection, but is not successful in treating meningoencephalitis caused by other amoebae. The dose of Amphotericin B for *Naegleria* is 1.5 mg/kg body weight per day for 3 days then followed by a dose of 1 mg/kg body weight per day for 6 days. For children, the drug is given in 2 doses. In acanthamoeba meningitis combination treatment of trimethoprim/sulfamethoxazole, rifampin and ketoconazole gives satisfactory results. Amphotericin-B may also be the drug of choice for leishmaniasis in adult and pediatric doses of 0.5-1 mg/kg given IV given daily or every other day for up to 8 weeks. (Martinez, 2011)

OXYTETRACYCLINE

The anti-parasitic drug of choice that can be given to treat balantidiosis is oxytetracycline at an adult dose of 4x 500 mg per day (child dose is 40 mg/kg body weight, maximum 2 grams) per

day for 10 days. Metronidazole can be given at a dose of 3x750 mg per day (children dose 35-50 mg/kg body weight/day in 3 divided doses) for 5 days or iodoquinol given at a dose of 3x650 mg/day (child dose 40 mg/kg/day in divided in 3 doses) for 20 days. (Gaffar, 2014)

PARAMOMYCINE

Paramomycin for giardiasis is given in adult and pediatric doses of 25-35 mg/kg/day divided into 3 doses given for 7 days. The adult dose of furazolidone is 4x100 mg given for 7-10 days, and the child dose is 6 mg/kg/day divided into 4 doses given for 7-10 days. Quinacrine dose for adults 3x100 mg given for 5 days, and a dose of children 3x2mg/kg (maximum 300 mg/day) given for 5 days. (Bartges, 2011)

TRIMETOPRIM-SULFAMETOXAZOLE

In chronic infection of isosporiasis or moderately severe complaints, patients cyclosporiasis can be treated with sulfa preparations, such as trimethoprim-sulfamethoxazole (TMP-SMX) as the drug of choice. The adult dose given is: TMP 160 mg/SMX 800 mg given 2 times a day for 10 days. The pediatric dose is TMP 5 mg/kg-SMX 25 mg/kg given 2 times a day for 10 days. Patients who are allergic to sulfa can be treated with pyrimethamine. (Upton, 2011)

The drug of choice for *pneumocystis carinii* infection is TMP-SMX with adult/child dosage: TMP 15 mg/kg/day-SMX 75 mg/kg/day orally or IV in 3 or 4 divided doses given for 14-21 days. As a substitute drug, Primaquine can be given at a dose of 30 mg (base) / day orally plus clindamycin 600 mg intravenously or 300-450 mg orally given every 6 hours for 21 days. To treat atypical pneumonia, pentamidine can be given intramuscularly, at a dose of 4 mg. per kilogram of body weight for 14 days of treatment. In addition, the combination of trimethoprim-dapsone with a dose of TMP 3x 5 mg/kg/day and dapsone 100 mg/day was administered together for 21 days. In accordance with the clinical symptoms and complaints that occur and to support treatment, antibiotics, oxygen, and improvement of the patient's nutrition can be given. (Sodeman, 2011)

NITAZOXANIDE

The FDA recommends the use of Nitazoxanide to treat cryptosporidiotic diarrhea in patients with normal immune systems. This drug is given orally in adults at a dose of 2x500 mg for 3 days. While children aged 1-11 years can be given at a dose of 2x 100-200mg for 3 days. Because infections in normal people generally resolve on their own, if Nitazoxanide is not available the patient is only given supportive therapy with fluid and electrolyte management if severe diarrhea occurs. (Upton, 2011)

CONCLUSION

From this review, it can be concluded that in addition to the nitroimidazole group, clefamide, amphotericin-B, oxytetracycline, trimetoprim-sulfamethoxazole, paramomycin, and nitazoxanide can also be used as alternative treatments.

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