

What is the most appropriate treatment for giardiasis?

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The World Health Organization has produced guidelines for the management of common illnesses in hospitals with limited resources. This series reviews the scientific evidence behind WHO's recommendations. The WHO guidelines, and more reviews are available at:

http://www.who.int/child-adolescent-health/publications/CHILD_HEALTH/PB.htm

This review addresses the question: *What is the most appropriate treatment for giardiasis?*

The WHO Pocketbook of Hospital Care for Children [1] recommends for giardiasis metronidazole 5 mg/kg 3 times a day for 5 days. (Pocketbook chapter 5.3.1, page 123).

INTRODUCTION:

Giardia Lamblia is the most commonly detected pathogenic protozoan in the human intestine. [2] Found in about 20% in patients with diarrhoea, its incidence may be as high as a billion cases, contributing to the 2.5 million annual deaths worldwide from diarrhoeal disease. [3] The most prominent symptoms, generally appearing 6-15 days after infection, are steatorrhoea, weakness, weight loss and abdominal pain. Mostly these are self-limiting, though it is estimated that 30-50% of patients develop chronic disease. Steatorrhoea, iron deficiency anaemia, micronutrient deficiencies and malnutrition are among the long-term sequelae and can cause failure to thrive and psychomotor retardation in children. [5]

METHODOLOGY

Search terms [*Giardia*] AND [treatment OR therapeutics] AND [*child* OR *paediat* OR *pediat*] were entered into MEDLINE, EMBASE and GLOBAL HEALTH with results limited to English language and 1990-2007.

Only randomised controlled trials (RCTs) performed in low or middle income countries (according to the World Bank) were eligible for inclusion. Recent literature reviews [6,7] were also searched to ensure that no pertinent RCTs had been overlooked. Aside from two exceptional cases [8], [9], only studies that featured both children with mono-infection and those who had presented symptomatically to health services, were included. The exceptions were included due to their high quality. 15 trials met the inclusion criteria and depending on the number of SIGN 50 criteria 27 they met, were sub-classified '1-', '1+' or '1++'.

RESULTS

The literature on giardiasis since 1990 has concentrated on a relatively consistent set of pharmacological agents. In the RCTs included in this review metronidazole, currently the first line treatment, was shown to completely clear the protozoa on parasitological analysis with an efficacy ranging from 75-100% of patients [8], [10], [11], [12], [16], [18], [20], [21], [22]. However, other nitroimidazoles (tinidazole, ornidazole and secnidazole), which have the advantage of requiring only a single dose, have demonstrated at least equivalent efficacy (100%, 79-100% and 82-93% respectively) [9], [11], [13], [14], [19], [20]. The benzimidazoles, albendazole and mebendazole, were shown to be slightly less effective; results range from 50-100% and 58.3%-100% respectively [8-19].

No drug was reported to be unsafe, causing only mild to moderate and transient side effects (SEs). Whilst metronidazole was reported to produce SEs in up to approximately a quarter of patients (0-27%) [9], [17], [18]; tinidazole caused similar effects in nearly to two thirds of children in one study (28-59%). Most common SEs included nausea and vomiting, metallic taste, headache and vertigo [8], [10], [11], [12], [16], [18], [20], [21], [22]. Various studies confirm the lower incidence of reported SEs with albendazole (0-8%) [8], [12-15], [17].

Albendazole, mebendazole, metronidazole are on the WHO essential paediatric drug list. [23] Of the other drugs reviewed, only tinidazole is available cheaply in generic form from large international pharmaceutical suppliers. Tinidazole is the cheapest of these at \$40 per 1000 children treated compared to \$45 for metronidazole. Albendazole and Mebendazole are more expensive at \$52 and \$86 respectively. [24]

DISCUSSION

The nitroimidazoles appear to remain the most effective drugs available for treating giardiasis. The results of this review suggest that a single dose of tinidazole (50mg/kg) has a similar efficacy to that of metronidazole, though the former has particular advantages in a resource poor setting. It is generally well tolerated and, because it requires only a single dose, has the potential to improve compliance. It is also slightly cheaper than metronidazole per treatment.

It is therefore suggested that the current WHO guidelines may no longer be the most appropriate; though this is mitigated by awareness that long term safety data for tinidazole is not available in either adults or children. As cases of resistance to all anti-giardial agents have been reported, it is important that

physicians have access to a range of medications and, in regions where the disease is prevalent, it is imperative to periodically audit local drug sensitivity patterns.

Summary

Decades of evidence confirm that giardiasis responds well to antimicrobial treatment, decreasing the length of the illness and reducing the possibility of long term complications 25, 26. Nitroimidazoles are the most effective drugs available, and considering compliance, side-effects and cost, a single dose of tinidazole is the most appropriate treatment for children in resource poor settings.

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