ORIGINAL ARTICLE

Effectiveness of oral Albendazole as a Treatment for Pediculosis Capitis

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ABSTRACT

Background: Pediculosis capitis remains a problem worldwide. In addition, there is evidence that head louse is becoming resistant to common pediculicides.

Objective: The aim of the present study was to evaluate the effectiveness of oral albendazole therapy in the treatment of pediculosis capitis.

Patients and Methods: Sixty patients with pediculosis capitis were enrolled in this study. They were divided into 3 groups. Group I included 20 patients treated with oral albendazole (400 mg single dose). Group II included 19 patients treated with topical 0.5% malathion lotion. Group III included 21 patients treated with both regimens. All patients were instructed to repeat treatment at day 10. Two weeks after the initial visit, patients were reexamined to evaluate treatment outcome. Patients with moving adult lice or nymphs were regarded as failure of the therapy. Also patients were asked about side effects from treatment.

Results: Out of the 60 patients, 58 were girls and 2 were boys. Their ages ranged from 4-14 years with a mean age of 9.25 years (mean ± SD; 9.25 ± 3.452). Successful treatment was observed in 31 patients (51.67%, 30 females and 1 male). They were 6 out of 20, 11 out of 19 and 14 out of 21 in group I, II and III respectively. Regarding overall treatment outcome, there was no statistically significant difference between the 3 groups (p-value = 0.051). However, the number of responding patients in group III was more than that in group II and I (14 out of 21, 11 out of 19 and 6 out of 20 patients respectively). Side effects were rare and minimal.

Conclusion: Although not statistically significant, 400 mg oral albendazole/topical malathion combination was more effective than either one alone, while the least effective was the oral albendazole.

KEYWORDS: Albendazole, treatment, pediculosis capitis

INTRODUCTION

Human head louse, Pediculus humanus capitis, or pediculosis capitis, is a common health problem in the world. Pediculosis capitis is the most prevalent parasitic infection of children in many countries. Scalp itching is a common symptom in the infested people, although infested patients with pediculosis can be asymptomatic.[1] Pediculosis capitis occurs primarily in school-aged children, but may affect all age groups and socioeconomic levels.[2] The gold standard for diagnosing head lice is the identification of a live louse, nymph, or a viable nit on the head. Using lice combs increases the chances of finding live lice and is a helpful screening tool.[3]

There are three fundamental methods that are effective in treatment of pediculosis; topical pediculicides, wet combing and oral therapy.[1] The pyrethrins and pyrethroids are the major commercially available pediculicides in the market currently.[4] First-line pharmacologic treatment of pediculosis is permethrin 1% lotion or shampoo. Multiple novel treatments have shown limited evidence of effectiveness superior to permethrin.

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Wet combing is an effective non pharmacologic treatment option.[5]

The recent increase in the prevalence of pediculosis internationally, has been suggested to be the result of incorrect use of topical insecticides, and consequently growing resistance to commonly used pediculicides with a neurotoxic mode of action, such as those containing permethrin and malathion.[2] The extensive use of pediculicides with a neurotoxic mode of action has led to the development and spread of resistant head lice populations all over the world. This triggered the development of compounds with other modes of action.[6] This study aimed to evaluate the effectiveness of oral albendazole therapy in the treatment of pediculosis capitis.

PATIENTS AND METHODS

This study included 60 patients with pediculosis capitis. They were recruited from the attendants of the outpatient dermatology clinics of Al-Azhar University Hospitals in the period from April 2014 to October 2014.

Exclusion criteria included: patients with known hypersensitivity to albendazole; previous treatment directed against head louse in the past month; and patients below the age of two years. An informed consent was taken from all patients (or their parents or guardians) before enrollment in the study.

All members were subjected to:

1. History taking: A) Age, sex, residence, history of medications and history of drug sensitivity, B) History of previous treatment directed against pediculosis, C) History of scalp complaints (e.g. itching).

2. Examination and diagnosis of pediculosis capitis: A) Presence of moving lice or nits, B) Erythema, scales, erosion, impetigo or folliculitis affecting scalp, face or neck, C) Presence of lymphadenopathy, D) Active infestation was diagnosed by the presence of moving adult louse or nymph.

3. Medication: Patients were divided into 3 groups as follows: Group I included 20 patients treated with oral albendazole (400 mg single dose - tablet or syrup). Group II included 19 patients treated with topical 0.5% malathion lotion. Group III included 21 patients treated with both malathion and oral albendazole. All patients were instructed to repeat treatment at day 10. Patients with signs of secondary bacterial infection were treated additionally with appropriate systemic antibiotic. Patients used malathion were asked to follow the following instructions: a) Adequate amount of the malathion lotion should be applied on dry hair especially behind the ears and on the back of the head (to wet the hair completely), avoiding contact with the face. b) Allow the hair to dry. c) Leave the lotion for 12 hours. d) Rinse the hair thoroughly with tap water.

4. Follow up: Two weeks after the initial visit, patients were reexamined to evaluate treatment outcome. Patients with moving adult lice or nymphs were regarded as failure of the therapy. Also patients were asked about side effects from treatment.

STATISTICAL ANALYSIS

Statistical analysis was carried out using SPSS (version 17.0; SPSS Inc., Chicago, IL, USA). Quantitative data were analyzed using mean and

standard deviation (SD). Paired t test was used to test for significant difference between two sample means. P values < 0.05 were considered significant.

RESULTS

Out of 60 patients with pediculosis capitis, 58 were females and 2 were males. Their ages ranged from 4-14 years (mean ± SD; 9.25 ± 3.452). Group I patients were 19 females and 1 male; their ages ranged from 4-14 years (mean ± SD; 9.2 ± 3.254). Group II patients were 19 females; their ages ranged from 4-14 years (mean ± SD; 8.473 ± 3.82). Group III patients were 20 females and 1 male, their ages ranged from 5-14 years (mean ± SD; 10 ± 3.286).

Successful treatment was observed in 31 patients (51.67%, 30 females and 1 male). It included 6 out of 20, 11 out of 19 and 14 out of 21 in group I, II, and III respectively. Regarding overall treatment outcome, there was no statistically significant difference between the 3 groups (p-value = 0.051). However, the number of responding patients in group III was more than that in group II and I (14 out of 21, 11 out of 19 and 6 out of 20 patients respectively) (Table 1). The side effects were rare and minimal, with no statistically significant difference between the 3 groups (p-value = 0.997). These included 1 patient with mild abdominal pain in group I, 1 patient with burning sensation in the scalp in group II and 1 patient with anorexia and mild abdominal pain in group III (Table 2).

Table 1 Treatment outcome among the three groups

Treatment groups	Treatment outcome				Total	Chi-Square	
	Successful treatment		Treatment failure				
	N	%	N	%		X^2	P-value
Group I (oral albendazole)	6	30.00	14	70.00	20	5.947	0.051
Group II (topical malathion)	11	57.89	8	42.11	19		
Group III (oral + topical)	14	66.67	7	33.33	21		
Total	31	51.67	29	48.33	60		

Table 2 Side effects among the three groups

Treatment groups	Side effects			Chi-Square	
	Incidence		Type		
	N	%		X^2	P-value
Group I (oral albendazole)	1	5.00	Mild abdominal pain	0.0053	0.997
Group II (topical malathion)	1	5.26	Burning sensation in the scalp		
Group III (oral + topical)	1	4.76	Anorexia and mild abdominal pain		

DISCUSSION

For several decades, treatment of head lice infestation has centered primarily on topical ovicides and pediculicides. Lice have become increasingly resistant to pyrethroids (such as permethrin) and lindane. Permethrin is no longer considered ovicidal.[7] The emergence of resistance to commonly used pediculicides has long been recognized. Therefore, to avoid such resistance to pediculicides, the use of different drugs may be important. Several anthelminthic agents including ivermectin and levamisole have been reported as effective treatments for pediculosis capitis.[8]

Albendazole is a benzimidazole with broad spectrum of activity against helminth parasites.[9] Ayoub et al[10] reported successful treatment with topical application of albendazole in four patients with head lice. Akisu et al[8] investigated if albendazole could be used in the treatment

of pediculosis capitis in combination with 1% permethrin or alone. They reported various degree of effectiveness in their study groups.

This study was done to evaluate the anti-louse effect of systemic albendazole in an attempt to confirm or contradict its reported efficacy in pediculosis capitis. We investigated oral albendazole (400 mg) in the treatment of pediculosis capitis alone, and in combination with malathion 0.5% lotion versus topical malathion 0.5% alone. We found that only 30% of patients (6 out 20) receiving 400 mg albendazole orally showed effective results manifested by absence of moving head lice.

This unsatisfactory result (30% efficacy) was not similar to those of Akisu et al[8] who reported the successful use of oral albendazole alone and combined with permethrin in the treatment of pediculosis capitis. In their study, 150 children were randomly divided into five equal groups. Group 1 got albendazole in a single dose (400 mg), group 2 got albendazole at 400 mg for 3 days, group 3 was given 1% permethrin, group 4 took 1% permethrin and albendazole in a single dose (400 mg), and group 5 got 1% permethrin and albendazole in a dose of 400 mg for 3 days. Groups given albendazole were also given another 400 mg dose of albendazole after 1 week. The success rate of treatment at the 2-week follow-up for all groups was 61.5%, 66.6%, 80.0%, 84.6%, and 82.1%, respectively.

In Akisu et al[8] study, the use of topical 1% permethrin increased success rates of oral albendazole from 61.5% and 66.6% in group 1 and 2 to 84.6% and 82.1% in group 4 and 5 respectively. In line with the result, the use of topical 0.5% malathion increased success rate of oral albendazole from 30% (group I; oral albendazole) to 66.67% (group III; oral albendazole + topical malathion). Both studies indicate that the combined therapy is more effective than either one alone.

A more successful treatment outcome with 0.5% malathion application was also reported by Chosidow et al[11] (85.0% versus 57.89% in our study). They used 0.5% malathion lotion, given on days 1 and 8, for patients with live lice, not eradicated by topical insecticides used 2 to 6 weeks before enrollment. Three hundred and fifty two of the 414 patients were free of head lice on day 15. Although both gave positive result, the difference between both studies may be attributed to the difference in number of patients (414 versus 60), or the difference in infestation density or patient compliance.

Ivermectin is an antihelminthic agent which was investigated in the treatment of head lice. In a study conducted by Youssef et al[12] topical 0.8% ivermectin lotion was shown to be effective in all 25 patients included in their study. Also patients who received topical 0.5% ivermectin lotion were more louse-free than those who had received vehicle control.[13] Chosidow et al[11] have suggested that for difficult-to-treat head-lice infestation, oral ivermectin (400 mcg per kg), given twice at a 7-day interval, had superior efficacy as compared with topical 0.5% malathion lotion. Moreover, in an in vitro assay examining the effectiveness of 1, 0.5, and 0.25% ivermectin formulations for the topical treatment of the human head louse, the formulations were 100% effective in killing permethrin-resistant lice after 10-min exposures.[14]

Another potent and broad-spectrum antiparasitic, thiabendazole, was reported to be also effective against pediculosis capitis. Namazi[15] found that 61% of patients with head lice showed complete response after using thiabendazole 20 mg/kg

twice daily for 1 day, repeated after 10 days. The author proposed that thiabendazole, either alone or in combination with other agents, may prove to be of particular use in areas where head lice shows resistance to common pediculicides.

Interestingly, Kurt et al[16] compared the result of medical pediculicides, to combing only by precision detection comb (combing every second day for 14 days) or metal pin comb (combing once in every 4 days for 15 days). To see if it could be an effective alternative to the use of anti-lice products in children, a total of 560 children from two rural schools in Turkey were screened. They were divided into two groups (dry combing and wet combing) for both trials. In the end, no louse was found in 54.1% and 48.9 % of children in the precision detection comb and metal pin comb trials, respectively. The results showed no significant differences between dry and wet combing strategies for both combs. They concluded that regular combing by special combs decreases head lice infestation level in children and can be safely applied as a long-term treatment.

Comparing the treatment side effects, only one (2.5%) of the patients on 0.5% malathion lotion complained of burning sensation in the scalp following treatment application. This coincides with Chosidow et al,[11] who found that 5 of the 414 patients (1.2%) treated with malathion discontinued treatment because of an adverse event. They also reported an 11-year-old girl had a severe headache 6 days after the first application of malathion lotion and was hospitalized overnight as a precautionary measure; she recovered fully. In this study, side effects from albendazole were minimal (one patient showed abdominal pain, another one complained from both anorexia and abdominal pain); this coincides with the reported safety of albendazole. Albendazole has been shown to be both safe and easy to administer within the community.[9]

CONCLUSION

Although not statistically significant, the combined oral albendazole and topical malathion was more effective than either one alone, while the least effective was the oral albendazole. Because of emerging pyrethroid resistance, malathion is considered an effective alternative. However and with time, a malathion resistance could also emerge. So, we encourage large scale new researches using the systemic antihelminthic and/ or other agents as an oral or topical therapeutic tool for treatment of pediculosis.

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