

The Effect of Garlic Powder on *Enterobius vermicularis* infection

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Summary:

Background: *Enterobius vermicularis* causes infection in different age groups, but specially in small ages. It is well known that parasitic infection in most middle eastern countries is common among them is *Enterobius vermicularis*, in which 11% is in school- children & 14% in pre-school children. In Iraq several studies on the prevalence of Enterobiasis in different age groups & from different areas were reported.

Aim of study: This study was conducted to look for the therapeutic efficacy of garlic powder against Enterobiasis and the recurrence of this infection in many individuals to be compared with the drugs of choice that is a single dose, 100 mg of mebendazole tablets.

Patients & Methods: One hundred and sixty patients were included in this study mostly were children, suffering from the clinical manifestation of Enterobiasis and confirmed by scotch tape slide method for identification. Those patients are divided into 2 groups: -

1- first group including 80 patients treated by garlic capsule 400 mg

2- Second group included 80 patients treated by mebendazole tablets 100mg.

Results: We found that the highest incidence of Enterobiasis was in females 56.9% than males 43.1% simultaneously age group 6 to 10 years showed the highest rate of infection. Our results showed that the typical dose of garlic capsule to eradicate *Enterobius vermicularis* 100% is one capsule twice daily for three consecutive days. All patients and control group were followed up to 6 months and it has been noticed that patients who received garlic therapy had no recurrence, except three patients as compared with twenty-five patients of control group.

Conclusion: Our study had proved the therapeutic efficacy of garlic powder against Enterobiasis and we recommended it to be used instead of mebendazole.

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Introduction

Enterobius vermicularis is considered as a small threads-like worm, cosmopolitan in different parts of the world including our country. It causes infection in different age groups, especially small age groups (1). It inhabits the large intestine of the humans and is of low pathogenicity (2). The gravid female migrates at night from anus to perianal and perineal regions for ovi position causing local itching. Extraintestinal infection by *Enterobius vermicularis* is uncommon, it has been reported to occur in the peritoneal cavity, ovary, fallopian tube, endometrium, lung, liver and urinary tract (3). And also affects the intelligence quotient (I. Q.) of the children (4). It is well known that parasitic infection in most of the Middle Eastern countries is common, among parasite infection the

incidence of *Enterobius vermicularis* is 11% in school- children and 14% in pre-school children (2).

In Iraq several studies on the prevalence of Enterobiasis in different age groups and from different areas were reported very low prevalence rate (0.3%-6%) (7,8,9).

In other study the prevalence was 28% among school children (1). To the best of our knowledge, no or little informations are available regarding the treatment of Enterobiasis. The usual drug is the orally administration of either a single dose, 100mg of mebendazole or pyrantel 10 mg/kg and repeated after 2 weeks, so we had suggested a new powerful, cheaper, safer drug with no side effect and with short duration of recovery that is Garlic capsule. 400 mg to be used instead of routine chemotherapy to avoid the recurrence of infection.

Patients and Methods

One hundred and sixty patients living in Al-Sha'ab city with clinical diagnosis of Enterobiasis (local itching, restless sleep, diminished appetite, biting of nails, picking of nose, grinding of teeth,

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pallor, salivation and lower abdominal pain), were eligible to be included in this study during the period from July 2001 to February 2002. They were 91 female and 69 males, 102 were children age from 18 months to 15 years, and 58 were adult aged up to 54 years. To confirm the diagnosis of Enterobiasis we used Scotch tape slide method for anal swab and advised the patients on how and when they take the swab. These slides were examined at parasitology lab. Department of Microbiology College of Medicine, Baghdad University, using light microscope to identify eggs, larvae and sometimes adults of *Enterobius vermicularis*. The patients were divided into five groups:

Group I: 20 patients, aged 18 months to 7 years, were given one garlic capsule (400mg) once for one day.

Group II: 20 patients, aged 5 to 51 years, garlic capsule (400mg) twice for one day.

Group III: 20 patients, aged 6 to 15 years, were given one garlic capsule, twice daily for 2 days.

Group IV: 20 patients, aged 16 to 54 years, were given one garlic capsule twice daily for 3 days.

Group V: (Control) 80 patients aged, 18 months to 54 years were given a single dose of mebendazole tablets 100 mg.

All patients with the control group were followed up to 6 months after treatment to look for re-infection and recurrence of the clinical manifestations.

Results

This study is the first to be done in our country using garlic powder as a treatment against Enterobiasis. The highest incidence of infection was shown in females 56.9% than in males 43.1%, at the same time age group of 6-10 years had shown the highest rate of infection (Table 1) (Table 2) showed the clinical pictures of Enterobiasis before treatment; itching, restless sleep and behavioral disturbance were seen in all patients included in this study, while lower abdominal pain was observed in 20 patients only.

Garlic capsule in a dose of one capsule 400 mg twice daily for three consecutive days was highly effective.

The parasite was completely eradicated 100% without recurrence in a 6-month duration after treatment with garlic as compared with the eradication of the parasite in the control groups 31.25% who had taken a single dose of mebendazole tablet 100-mg in the same

Discussion

Of the gastro-intestinal tract infection, Enterobiasis almost found in all socio-economic levels and in every geographical area. It perhaps the most frequent encountered in pediatric practice (1,2,10,11). This study showed that the highest

incidence of infected patients 32.5% with Enterobiasis was among age group 6 to 10 years. Some workers found that the rate of infection among school children was 29.3% (5), while others found that it was 11% among the same age group (4).

The infection was higher in females 56.9%, than in males 43.1%. The result of our study confirms those of other investigator (4) and contrary to reports of some (1).

Other study in Venezuela found that there was no difference between sexes, but there was difference between age (10). In this study our findings are higher than all other studies which were done on different age groups and from different socioeconomic levels.

This is probably due to the method they used which was direct stool examination only. Usually the rate of pinworm infection depends on various factors like socio-economic level of studied patients, time of obtaining the samples and experience of the examiner. Because of economic block & shortage of nutrition & chemotherapy we had thought of using alternative agent like garlic against Enterobiasis, in which it was subjected in some studies as antimicrobial and anti-parasitic agent (6), therefore we decided to give it to the patients with Enterobiasis which is widely spread in our country especially among children and it has a relationship with many diseases as previously mentioned such as UTI & enuresis (11). Follow up of all studied groups including the control one was done for 6 months and scotch tape slide method was taken monthly. It has been found that all patients treated with garlic, except 3 girls, show negative results.

The clinical pictures like diminished appetite, pallor, nervous reflux & others were disappeared.

Those 3 girls were from low socioeconomic levels with poor personal hygiene and with heavy infection before treatment (the adult worms found moving on their back or every where of the body), they were found to be re-infected. Even though the 3 girls show light infection after garlic therapy with milder clinical manifestations. While twenty-five individuals of control group showed re-infection.

This may be due to the fact that garlic could provide a certain action which prevent the growth of pinworm in the large bowel for along period, or it may improve the immunity of the patient indirectly. However, it has been found that a single (100 mg) dose of mebendazole was ineffective as compared with patients groups treated by garlic capsule in which the latter was readily accepted by all treated patients & it was free of notable side effects.

Table. 1
Age and sex distribution of pinworm infection among 160 patients

Sex Age/Year	Numbers of females	Numbers of males	Total	Percentage
0.5-5	16	15	31	19.4%
6-10	35	17	52	32.5%
11-15	6	13	19	11.8%
16-20	6	9	15	9.4%
21-30	14	6	20	12.5%
31-40	12	4	16	10%
41-50	0	0	0	0%
51-60	2	5	7	4.4%
Total	91	69	160	100%
Percentage	56.9%	43.1%	100%	

Table. 2 Signs & symptoms of Enterobiasis before treatment

Signs & symptoms	Numbers of patients	Percentage
Grinding teeth	90	56.3%
Biting nail	100	58.8%
Picking nose	88	55%
Itching	160	100%
Salivation	40	25%
Restlessness sleep	160	100%
Lower abdominal pain	20	12%
Behavioral disturbance	160	100%
Diminished appetite	122	76.3%
Pallor	50	58.8%

Table. 3
The therapeutic efficacy of garlic capsule on groups of pinworm infected patients compared with control groups

Group number	Numbers of patients	Age group	Dosage 400mg	Course duration of treatment of day	Number of cured patients after of treatment 2 weeks- 6months	Percentage
I	20	1.5-7	1	1	19	95%
II	20	5-15	2	1	19	95%
III	20	6-15	2	2	19	95%
IV	20	16-54	2	3	20	100%
V*	80	1.5-54	1	1	25	31.25%

* V = control group took single dose of mebendazole 100 mg.

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