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Does garlic oil have a role in the treatment of Helicobacter pylori infection ?

Helicobacter pylori infeksiyonunun tedavisinde garlic oil' in yeri var mıdır ?

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ÖZET: *Helicobacter pylori (H. pylori), nonspesifik kronik gastrit ve peptik ülser hastalığının patogenezinde rolü olan en önemli faktörlerden biri olarak kabul edilmektedir. Ancak, henüz ideal bir tedavi şekli belirlenememiştir. Allium sativum'un (garlic) hemen hemen tüm bakterilere karşı etkili olduğu gösterilmiştir. Garlic oil'in tek başına ya da proton pompası inhibitörü omeprazol ile kombine olarak H. pylori infeksiyonunun tedavisinde etkili olup olmadığının belirlenmesi amacıyla, dispeptik yakınmaları olan 20 H. pylori(+) hasta çalışmaya alındı. Garlic oil 3X275mg dozda tek başına (n=10) ya da omeprazol 2X20mg ile kombine olarak (n=10) iki hafta süreyle verildi. Tedavinin tamamlanmasından bir ay sonra hastalar tekrar değerlendirildi ve tümünde H. pylori infeksiyonunun halen devam ettiği saptandı. Histolojik olarak, kronik aktif gastrit bulgularında ve H. pylori yoğunluğunda da değişiklik görülmedi. Sonuç olarak, garlic oil kapsüllerinin H. pylori infeksiyonunun tedavisinde herhangi bir etkisinin olmadığı saptandı. Bu konunun kesin olarak belirlenebilmesi için, taze sarmısak ekstreleri gibi, esas antibakteriyel komponent olan allicin'i daha fazla içeren ürünlerle yapılacak ileri çalışmalara gerek vardır.*

Anahtar Kelimeler: **Helicobacter pylori, tedavi, garlic oil, omeprazol**

SUMMARY: *Helicobacter pylori (H. pylori) is generally accepted as one of the most important factors in the pathogenesis of nonspecific chronic gastritis and peptic ulcer disease. However, an ideal treatment schedule is not yet available. It has been shown that allium sativum (garlic) has a wide effect against almost all kinds of bacteria. In order to investigate whether garlic oil has a role in the treatment of H. pylori infection, alone or combined with proton pump inhibitor omeprazole, 20 H. pylori (+) patients with dyspeptic complaints were studied. Patients were assigned to receive either garlic oil 275 mg caps t.i.d (n=10) or garlic oil 275 mg caps t.i.d. plus omeprazole 20 mg caps b.i.d. (n=10) for two weeks. One month after discontinuation of treatment, the patients were re-assessed and all of them were still found as H. pylori (+). H. pylori density and histological findings of active chronic gastritis were unchanged. In conclusion, this study showed no effect of garlic oil capsules on H. pylori infection. It needs further studies with other products such as fresh garlic extracts which contain much more allicin, the main antibacterial component.*

Key Words: **Helicobacter pylori, treatment, garlic oil, omeprazole.**

HELICOBACTER pylori (H. pylori) is gaining increasing interest in gastroenterology because of its causal role in the pathogenesis of nonspesific chronic gastritis and peptic ulcer disease (1,2). In addition, H. pylori is now thought to act as a cofactor for the development of gastric carcinoma (3). Because eradication of H. pylori might cure peptic ulcers and probably prevents the development of gastric carcinoma, more attention has been focused on anti-H. pylori therapy.

Triple-therapy schedules consisting of bismuth salts, metronidazole and amoxicillin or tetracycline eradicate H. pylori in a high percentage of treated patients (4). However, side effects, resistance to metronidazole, and lack of patients' compliance limit the efficacy of tripple-therapy (5). Therefore, efforts have intensified to find alternative therapies include high degree of effectiveness and safety, coupled with low cost and incidence of side effects. Recent studies indicate that combination of proton pump inhibitor omeprazole with antibiotics, such as amoxicillin and clarithromycin, might eradicate H. pylori in a high percentage of infected patients (6-10).

Allium sativum (garlic) is employed in popular medicine, in many parts of the world both for

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Table 1. Characteristics of patients included in the study

	Treatment	
	Garlic oil	*Garlic oil plas omeprazole*
No of patients	10	10
Mean (range) age (years)	43.8 (24-59)	45.7 (21-61)
No of men/women	3/7	2/8

prophylaxis and for cure of a variety of diseases (11). It has been shown that, garlic extracts have a wide effect against almost all kinds of bacteria, including bacillus, staphylococcus, escherichia, pseudomonas, streptococcus, vibrio, and mycobacteria species (11,12). Garlic oil capsules contain less allicin, the main antibacterial component, than fresh garlic extracts. However, the capsules contain diallyl disulphide, which is known to have some antibacterial activity, being weaker than allicin (12).

The purpose of this study was to evaluate the efficacy of garlic oil capsules, which contains 800 μg allicin, alone and in combination with a proton pump inhibitor omeprazole, in the treatment of H. pylori infection.

MATERIALS AND METHODS

Twenty H. pylori (+) patients with dyspeptic complaints for at least two months were included in the study. Fifteen of them were female and 5 were male, between the ages of 21-61 years (Table 1). All patients underwent esophagogastroduodenoscopy. No endoscopic abnormality was seen, except erythemateous gastritis and/or bulbitis. Routine biochemical analysis, abdominal ultrasound, barium enema, computerised abdominal tomography and endoscopic retrograde cholangiopancreatography (if necessary) also showed no abnormality. Patients with severe concomitant disease, simultaneous treatment with bismuth salts or antibiotics, manifest disorders of clotting and a history of stomach resection were not included.

Two biopsy specimens of the antrum and two of the gastric body were taken and were analysed by histology after haematoxylin eosin and toluidine blue staining. Histologically normal gastric mucosa was classified as grade 0, mucosa showing only a mild increase in mononuclear cells in the lamina propria as grade 1, mucosa with expansion of the lamina propria by increased numbers of mononuclear cells as grade 2, and grade 3 combined features of grade 2 with acute inflammatory cells in the epithelium (active chronic gastritis). For semiquantitative grading of presence of H. pylori, the following criteria were used: grade 0: no bacteria detected; grade 1: sporadic bacteria observed; grade 2: many bacteria seen in most microscopic fields at high power magnification (400x); and grade 3: clusters of microorganisms found in the superficial mucus layer in all fields examined. In addition, two biopsy specimens of both antrum and body of the stomach were analysed by urease test (13). H. pylori infection was diagnosed when urease test was found to be positive and characteristic spiral shaped H. pylori microorganisms were seen on histological examination.

Patients were assigned to receive either garlic oil 275 mg caps, which contains 800 μg allicin, (Ortis laboratories, Elsenborn, Belgium) t.i.d. (n = 10) or garlic oil caps t.i.d. plus omeprazole 20 mg caps (Astra, Södertalje, Sweden) b.i.d. (n = 10) for two weeks. Written informed consent was provided from each patient. All cases were re-assessed one month after discontinuation of treatment. Patients' symptoms were also evaluated before the start of treatment and again immediately before control endoscopy. Dyspeptic symptoms (epigastric pain, heartburn, nausea, burping and meteorism) were scored numerically from 0 to 4, where 0 indicated absence of the symptom and 4 severe and incapacitating symptoms. Patients were regarded as H. pylori negative (eradication) when the final examination did not reveal bacteria either in the urease test or histologically.

The Wilcoxon's rank paired test was used for statistical analysis.

RESULTS

Before treatment H. pylori colonisation of the gastric mucosa had been detected by urease test and histology in all patients. Histology also showed that, all patients had active chronic gastritis (grade 3). After treatment, all patients were still found as H. pylori (+). The grades of gastritis and H. pylori were unchanged in all cases (Table 2). The mean symptom score was not significantly changed in both groups one month after completion of treatment (9.2 ± 1.55 versus 8.7 ± 1.70 and 9.0 ± 1.49 versus 8.5 ± 1.51, in garlic oil and garlic oil plus omeprazole groups, respectively). There were not any side effect in either group.

Table 2. Symptom score, grades of gastritis and H. pylori before and after treatment

		Before treatment	After treatment	p
Symptom score	Group I	9.2 ± 1.55	8.7 ± 1.70	NS
	Group II	9.0 ± 1.49	8.5 ± 1.51	NS
	Group I	3 ± 0	3 ± 0	NS
Hp density	Group II	3 ± 0	3 ± 0	NS
	Group I	2.1 ± 0.74	2.0 ± 0.82	NS
	Group II	2.0 ± 0.82	2.1 ± 0.74	NS

Group I: Treated with garlic oil alone
Group II: Treated with garlic oil omeprazole

DISCUSSION

Garlic continues to be one of the most intensively studied of medicinal plants. It has always had the reputation of being effective against stomach upsets, diarrhoea, dysentery, bronchitis, catarrh, throat and ear infection, ulcers and infected wound (12). There are also increasing reports focusing on anticarcinogenic and cardiovascular protective effects of garlic (14-17).

In 1858, Louis Pasteur, tested the antibacterial properties of garlic and he found that garlic killed or stopped the growth of bacteria, in vitro. In 1930, Lehman showed that the growth of Bacillus proteus bacteria was inhibited by a concentration of garlic extract as low as 1 part in 50.000. Other workers have also shown that garlic extracts have a broad action against almost all kinds of bacteria (12).

This clinical study showed no effect of garlic oil on H. pylori infection, both alone and in combination with omeprazole. This result might be due to several factors. It is known that, the main anti-infection component of garlic is allicin. Fresh extracts of garlic contain allicin, made from allicin, when garlic is crushed. However, the older extracts had little or no allicin. Because, it had all changed to diallyl disulphide and other sulphides. Garlic oil contains only the oily sulphides made when allicin breaks down. Although garlic oil capsules are fully active in protecting the circulation, it is known that they are much less effective than fresh garlic against infections. Because, the capsules contain only a little or no allicin. Pure diallyl disulphide, the main component of the oil, does kill bacteria, but is much weaker than allicin (12). Furthermore, the amount of actual garlic oil in the capsule might be inadequate for antibacterial activity.

In conclusion, in this study, garlic oil capsules neither alone, nor combined with proton pump inhibitor omeprazole showed any effect in the eradication of H. pylori. It needs further microbiological and clinical studies with other products such as fresh garlic extracts which contain adequate amount of allicin, the main antibacterial component.

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