

Use of *Anethum graveolens* in the management of patients with Irritable Bowel Syndrome

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Abstract

Background: Irritable bowel syndrome is a chronic gastrointestinal disorder affect quality of life for patients. Recently due to low level of satisfaction with the available treatment, high percent of IBS patients turn to complementary and alternative medicine especially herbal medicine.

Aims: To examine the effectiveness of *Anethum graveolens* in the Management of Patients with Irritable Bowel Syndrome.

Patients and Methods: Thirty two patients with IBS who diagnosed according to Rome criteria were allocated into 2 groups: group A, treated with the standard pharmacological agent mebeverine 135mg tid; group B, treated with capsules containing powder of crude plant of *Anethum graveolens* tid, for two weeks. The IBS symptoms were assessed before therapy and after two weeks, the symptoms evaluated were: pain severity, pain frequency, stool frequency, stool consistency, abdominal distension, incomplete evacuation, urgency and passing of mucus.

Results: Treatment of IBS patients with the tested herbal agents show improvement in all IBS symptoms after two weeks in both of individual symptom score or total score percent, treatment with *Anethum graveolens* show significant $P \leq 0.05$ improvement in total score percent 78.13%, compared to mebeverine 53.13%.

Conclusions: Patients with IBS may benefit from two weeks treatment with *Anethum graveolens*, administered as a capsule containing powder of crude plant, the improving effect occur in all IBS symptomed without any side effect reported indicating the efficacy and safety of *Anethum graveolens* in the management of IBS symptoms.

Keywords: Irritable bowel syndrome, *Anethum graveolens*, herbal medicine

INTRODUCTION

Irritable bowel syndrome IBS is defined as abdominal pain or discomfort that occurs in association with altered bowel habits over a period of at least three months.

IBS is a complex and widely encountered syndrome.^[1] IBS is a common disorder with a prevalence of 14% to 24% in women and 5% to 19% in men.^[2] Although most individuals meeting diagnostic criteria for IBS will not seek care, it accounts for 12% of visits to primary care physicians and 28% of visits to gastroenterologist.^[3] In

addition, IBS is associated with significant impairment in quality of life and significantly increased costs.^[4]

Despite recent advances in the treatment of IBS, the exact pathophysiology of IBS is still incompletely understood.^[5] Alteration in neurohormonal mechanisms and psychological factors, bacterial overgrowth, genetic factors, gut motility, visceral hypersensitivity, and immune system factors are currently believed to influence the pathogenesis of IBS.^[6] There are three IBS subgroups: those with constipation, those with diarrhea, and those with alternating constipation or diarrhea.^[7]

It is impossible to identify a single agent that act on all of the mechanisms underlying IBS due to their complexity. The use of dietary fibers, laxatives, antidiarrheal agents, and antispasmodic agents as first line therapies has been limited by marginal therapeutic benefits, and side effects. Antidepressants have shown efficacy for improving symptoms and psychological well-being. However, their use has been limited by side effects and poor acceptance by patients. Modulators of serotonin receptors have recently been developed and initially showed promising therapeutic effects.

Over the past two decades, there is a focusing on smooth muscle relaxants (commonly called antispasmodics). Mebeverine is at the top of list which has been successfully used in the management of IBS for many years. Mebeverine is a musclotropic agent that has antispasmodic activity and regulatory effects on the bowel function.^[8] During oral administration of at doses of 135-270 mg tid, it shows no typical anticholinergic side effect such as dry mouth, blurred vision, and impaired micturation. The incidence of side effects caused by mebeverine has not been demonstrated to be higher than that of a placebo.^[9]

Given the absence of a cure and the adverse effects of medications, patients considered conventional IBS treatment disappointing and often turn to complementary therapies. Herbal medicines have been used in Asia for a long time; an increasing number of IBS patients are beginning to receive complementary and alternative medicines in the West, most frequently herbal remedies.^[10] *Anethum graveolens* is a traditional herbal medicine that grows naturally in Iraq; it is widely used as a spice and also yields essential oil. It is an aromatic and annual herb of apiaceae family. The uses of dill seeds are carminative, stomachic and diuretic. There are various volatile components of dill seeds and herb; carvone being the predominant odorant of dill seed and a-phellandrene, limonene, dill ether, myristicin are the most important

odorants of dill herb. Other compounds isolated from seeds are coumarins, flavonoids, phenolic acids and steroids.^[11]

The aim of this study was to examine the effectiveness of *Anethum graveolens* as crude powder in the management of patients with IBS.

PATIENTS AND METHODS

This study was carried out on 32 patients of both sexes wit age range 22-63 years, diagnosed as having IBS for 5-10 years duration, who attend to outpatient clinic in Al-kindy College of Medicine for a period of 6 months; the study was approved by scientific and ethical committee in the university of Baghdad, an informed consent was taken from all the patients. Patients participate in this study were allocated into 2 groups:

- 1- Group A: composed of 16 patients treated with mebeverine tablets 135mg tid for 2 weeks.
- 2- Group B: composed of 16 patients treated with *Anethum graveolens* crude powder prepared as capsules, each capsule contain 500mg of fine powder of *Anethum graveolens* leaves and stems obtained from local markets, to be taken tid for 2 weeks.

The inclusion criteria were as follow:

1. Fulfilling the diagnostic criteria of IBS according to Rome criteria.
2. Lack of any endocrine illness.
3. Absence of any structural organic gastrointestinal abnormalities like inflammatory bowel disease (crohns and ulcerative colitis), diverticular disease, colorectal carcinoma, intestinal obstruction, peptic ulcer disorders, and biliary tract disorders.

Patients who are breast feeding woman, pregnant woman, and patient with chronic cardiovascular disease were excluded from the study.

Full history was taken from each patient in addition to general and systemic examination, a thorough examination of the abdomen was done, and abdominal ultrasound was done to exclude biliary tract disease and documentation of gases distended colon suggestive of IBS.

All of the patients were followed up for 2 weeks interval; data collection was depending on the questionnaire form based on the analysis of symptoms according to Rome criteria, and ranking the improvement as plus one (+1),

no improvement as zero (0), and worsening of the symptom as minus one (-1). Descriptive analysis of results was demonstrated as percentages, student t-test was utilized, P-value ≤ 0.05 considered significant result.

RESULTS

Table (1) showed that the incidence severity profile of the studied IBS symptoms were 54.29% of symptoms for moderate, while 23.05% of the incident IBS symptoms were severe, and 22.66% were mild.

Table (2) shows the improvement percentage in IBS symptoms after 2 weeks of administration of tested agents. For each group the improvement profile differ for each symptom, but overall, there is a good improvement, and there is no worsening in IBS symptoms. Mean of total improvement percentage indicate that treatment with *Anethum graveolens* (group B) was 78.13% significantly $P \leq 0.05$ higher than that of group A 53.13% (mebeverine).

As shown in table (2), treatment with mebeverine lead to improvement in IBS symptoms as follow: 62.5%

improvement in pain severity, pain frequency, stool frequency and stool consistency; at the same time, the improvement percent was 50% in both urgency and passing of mucus. 43.75% was the improvement in abdominal distension; while only 31.25% was the improvement percent in concerning incomplete evacuation.

On the other hand, treatment with *Anethum graveolens* cause 87.5% improvement in pain severity, pain frequency, stool frequency, stool consistency and abdominal distension, while 62.5% improvement in case of incomplete evacuation, urgency and passing of mucus compared to baseline values.

Overall, treatment with *Anethum graveolens* show improvement in all the studied IBS symptoms but in different percentages, there is no worsening in any of these symptoms, indicating the efficiency of *Anethum graveolens* in the improvement of IBS symptoms.

Table 1. Baseline distribution of symptoms in IBS patients.

Symptom	Mild	Moderate	Severe	Total incidence of IBS symptoms
1 Pain severity	8 (25%)	20 (62.5%)	4 (12.5%)	32 (100%)
2 Pain frequency	9 (28.13%)	17 (53.12%)	6 (18.75%)	32 (100%)
3 Stool frequency	8 (25%)	17 (53.12%)	7 (21.88%)	32 (100%)
4 Stool consistency	8 (25%)	17 (53.12%)	7 (21.88%)	32 (100%)
5 Abdominal distension	7 (21.88%)	18 (56.25%)	7 (21.88%)	32 (100%)
6 Incomplete evacuation	2 (6.25%)	16 (50%)	14 (43.75%)	32 (100%)
7 Urgency	8 (25%)	17 (53.12%)	7 (21.88%)	32 (100%)
8 Passing of mucus	8 (25%)	17 (53.12%)	7 (21.88%)	32 (100%)
Mean	22.66%	54.29%*	23.05%	

Results represent percent of total number of IBS patients, *= significant change $P \leq 0.05$.

Table 2. Improvement in symptoms of IBS patients after 2 weeks of treatment.

Symptoms	Group A			Group B		
	+1	0	-1	+1	0	-1
Pain severity	10 (62.5%)	6 (37.5%)	0.0 (0.0%)	14 (87.5%)	2 (12.5%)	0.0 (0.0%)
Pain frequency	10 (62.5%)	6 (37.5%)	0.0 (0.0%)	14 (87.5%)	2 (12.5%)	0.0 (0.0%)
Stool frequency	10 (62.5%)	6 (37.5%)	0.0 (0.0%)	14 (87.5%)	2 (12.5%)	0.0 (0.0%)
Stool consistency	10 (62.5%)	6 (37.5%)	0.0 (0.0%)	14 (87.5%)	2 (12.5%)	0.0 (0.0%)
Abdominal Distension	7 (43.75%)	9 (56.25%)	0.0 (0.0%)	14 (87.5%)	2 (12.5%)	0.0 (0.0%)
Incomplete evacuation	5 (31.25%)	11 (68.75%)	0.0 (0.0%)	10 (62.5%)	6 (37.5%)	0.0 (0.0%)
Urgency	8 (50%)	8 (50%)	0.0 (0.0%)	10 (62.5%)	6 (37.5%)	0.0 (0.0%)
Passing of Mucous	8 (50%)	8 (50%)	0.0 (0.0%)	10 (62.5%)	6 (37.5%)	0.0 (0.0%)
Mean of total percent	53.13%	46.87%	0.0%	78.13%*	21.87%	0.0%

Group A=Mebevrine, Group B= *Anethum graveolens*.

Results represent percent of total number of IBS patients; (+1) = improvement, (0) = no improvement, (-1) = worsening.

*= significant change $P \leq 0.05$.

DISCUSSION

There is an increase in the use of herbal medicine worldwide, a large number of herbal drugs are reported to have medicinal value, and are in use for the treatment of several conditions. In folk medicine, various drugs are used in single or combination forms for treating different types of conditions with considerable success. Although these drugs may be used for long time, and their medicinal uses and general safety are well known among people, their use has yet to be rationalized in therapeutics using standard methodology. Scientific studies are therefore required to assess their safety and efficacy.^[12] Keeping this view, in addition to other factors affecting treatment of IBS, like low level of satisfaction with treatment in current use,^[13] and absence of cure, in addition to adverse effect of medications, 50% of patients with IBS worldwide turn to complementary and alternative medicine therapies specially herbal medicine.^[14]

Anethum graveolens has been used to treat many gastrointestinal disturbances; in general it has been used mainly for its antispasmodic properties. Anethum is used as an ingredient in gripe water, given to relieve colic pain in babies and flatulence in young children. The seed is aromatic, carminative, mildly diuretic, stimulant and stomachic. The essential oil in the seed relieves intestinal spasms and griping, helping to settle colic. The carminative volatile oil improves appetite, relieves gas and aids digestion.^[15, 16]

In this study, a fine powder of crude plant is used after encapsulated for the treatment of IBS symptoms. The

results obtained in this study clearly showed the improving effect of *Anethum graveolens* crude powder on individual and overall IBS symptoms; by calculating the percentage of total improvement scores, results showed that *Anethum graveolens* crude powder is superior over the standard pharmacological agent mebeverine,^[17] table (2); the improvement in IBS symptoms is significantly $p \leq 0.05$ higher when compared with that of mebeverine. Results of this study showed that *Anethum graveolens* crude powder was used by all patients with high tolerability, and there is no any side effect recorded during the period of usage.

In conclusion, this study showed that patients with IBS may benefit from two weeks treatment with *Anethum graveolens* administered as capsule containing crude powder of the herb, the improvement in IBS symptom with this herbal agent was better than the standard pharmacological agent mebeverine; results showed that *Anethum graveolens* is safe and tolerable over treatment course.

Conflict of interest: none.

REFERENCES

1. Spiller R, Aziz Q, Creed F, Emmanuel A, Houghton L, Hungin P, et al. Guidelines on the irritable bowel syndrome: mechanisms and practical management. *Gut* 2007;56:1770-98.
2. Andrews EB, Eaton SC, Hollis KA, Hopkins JS, Ameen V, Hamm LR, et al. Prevalence and demographics of irritable bowel syndrome: results from a large web-based survey. *Aliment Pharmacol Ther* 2005;22:935-42.

3. Dean BB, Aguilar D, Barghout V, Kahler KH, Frech F, Groves D, et al. Impairment in work productivity and health-related quality of life in patients with IBS. *Am J Manag Care* 2005;11:S17-26.
4. Chang L. Epidemiology and quality of life in functional gastrointestinal disorders. *Aliment Pharmacol Ther* 2004; 20 Suppl 7:31-9.
5. Mathew P, Bhatia SJ. Pathogenesis and management of irritable bowel syndrome. *Trop Gastroenterol* 2009;30: 19-25.
6. Longstreth GF, Bolus R, Naliboff B, Chang L, Kulich KR, Carlsson J, et al. Impact of irritable bowel syndrome on patients' lives: development and psychometric documentation of a disease-specific measure for use in clinical trials. *Eur J Gastroenterol Hepatol* 2005; 17:411-20.
7. Mearin F, Balboa A, Badía X, Baró E, Caldwell E, Cucala M, et al. Irritable bowel syndrome subtypes according to bowel habit: revisiting the alternating subtype. *Eur J Gastroenterol Hepatol* 2003;15:165-72.
8. Talley NJ. Drug therapy options for patients with irritable bowel syndrome. *Am J Manag Care* 2001;7:S261-7.
9. Poynard T, Naveau S, Mory B, Chaput JC. Meta-analysis of smooth muscle relaxants in the treatment of irritable bowel syndrome. *Aliment Pharmacol Ther* 1994;8:499-510.
10. Magge S, Lembo A. Complementary and alternative medicine for the irritable bowel syndrome. *Gastroenterol Clin North Am* 2011;40:245-53.
11. Jana S, Shekhawat GS. Anethum graveolens: An Indian traditional medicinal herb and spice. *Pharmacogn Rev* 2010;4:179-84.
12. Shen YH, Nahas R. Complementary and alternative medicine for treatment of irritable bowel syndrome. *Can Fam Physician* 2009;55:143-8.
13. Thompson WG, Heaton KW, Smyth GT, Smyth C. Irritable bowel syndrome in general practice: prevalence, characteristics, and referral. *Gut* 2000; 46:78-82.
14. Hussain Z, Quigley EM. Systematic review: complementary and alternative medicine in the irritable bowel syndrome. *Aliment Pharmacol Ther* 2006;23:465-71.
15. Duke JA. *Handbook of Medical Herbs* CRC Press, London 2001.
16. Fleming T. *PDR for Herbal Medicines* Medical Economics Company, New Jersey 2000, 252-253.
17. Darvish-Damavandi M, Nikfar S, Abdollahi M. A systematic review of efficacy and tolerability of mebeverine in irritable bowel syndrome. *World J Gastroenterol* 2010;16:547-53.