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A Comparative Study of Dimethicone and Spearmint Anti-flatulence Effects on Reducing Flatulence in Patients with Irritable Bowel Syndrome

Ali Akbar Nasiri¹, Mina Pakmehr², Hosein Shahdadi^{*3}, Abbas Balouchi², Zahra sepehri⁴ and Ali Rashki Ghaleenov⁵

¹Dept of anaesthesiology and pain medicine, school of medicine, Zabol university of medical science, IR Iran.

²MSc Student of nursing ,Dept. of medical surgical ,Student Research Committee(SRC), School of Nursing and Midwifery, Zabol University of Medical Sciences(zbmu) , Zabol, IR Iran.

³MSc in Nursing, School of Nursing and Midwifery, Zabol University of Medical Sciences, Zabol, IR Iran.

⁴Department of internal medicine, Zabol University of medical sciences, Zabol, IR Iran.

⁵MSc student , Azad university of medical science ,Zahedan, IR Iran

ABSTRACT

Irritable bowel syndrome (IBS) is a functional bowel disorder that causes emphysema in patients. Intestinal gases affect all parts of one's digestive system and cause a significant discomfort in him. Most synthetic drugs used to reduce the flatulence have side effects therefore greater attention is drawn towards the use of herbal medicines. Spearmint oral drop is a new herbal medicine in Iran which belongs to the category of carminative drugs. Thus, this comparative study examines the effects of Dimethicone and Spearmint drop on the reduction of flatulence in patients. In this study, which is a single-blind clinical trial, after applying the inclusion criteria, a number of 60 patients with IBS who referred to clinics of Amir-al-Momenin (A.S) Hospital and Imam Khomeini Hospital with flatulence complaint were selected using the target-based approach. The patients were divided randomly into two groups of A and B. The group A was treated with Dimethicone and the group B was treated with Spearmint drop for a period of three weeks. The severity of symptoms were taken from the patients in 3 intervals (including at the time of admission, two weeks after the treatment and four weeks after the treatment (one week after discontinuation of the drug)) through VAS graph (Visual Analog Scale). Finally, the obtained data were analyzed by SPSS 18 software package and through using descriptive statistics tests, chi-square as well as Repeat Measurement test. The results of the study showed that the reduction of flatulence in patients using Dimethicone and Spearmint within two weeks after taking the drugs had no significant difference ($p = 0.4$). However, the reduction of flatulence symptoms in the fourth week of drug use was greater in patients using Spearmint ($p = 0.02$). Based on the present study, it seems that Spearmint herbal products, due to the effects they have on reducing the amount of flatulence, can be used as an effective drug in the treatment of flatulence in patients with IBS.

Keywords: Dimethicone, Spearmint, flatulence, irritable bowel syndrome

INTRODUCTION

Irritable bowel syndrome is often considered a functional disorder since no structural, biochemical or infectious etiology has been found for it. It seems that the main problem is related to motor or sensory dysfunction of the digestive system. Studies have shown that intestinal symptoms of irritable bowel syndrome are caused by disturbance of the large intestine microbial balance, which leads to flatulence. [1] Flatulence is one of the most common gastrointestinal disorders. This problem is referred to the feeling of abdominal distension and elongation which is associated with excessive gas, pushes the diaphragm upward and reduces lung expansion.

[2] The most common digestive problem that causes patients to go to the doctor is intestinal gases which impact on all parts of the digestive system and cause a significant discomfort in the person. [3] Flatulence is a personal feeling during which one's belly is felt to be bigger than normal. Thus, flatulence is a symptom associated with discomfort in the abdomen. In contrast, abdominal distention is a physical finding which is recognized during an examination by the doctor. [4] Flatulence diagnostic criteria according to the ROME III include: 1. Visible flatulence or distention feeling in recurrent form for at least three days per month in the past three months. 2. The absence of adequate criteria for the diagnosis of functional dyspepsia, irritable bowel syndrome or other digestive functional disorders. 3. The onset of symptoms is at least 6 months prior to the full existence of two above criteria and these criteria must also have completely occurred in the last three months. [5]

Almost 20% of 65-93-year-old patients had an experience of abdominal distention which is usually caused by intestinal gases. [2] According to the statistics, about 15-23% of Asian societies and 15-30% of American people suffer from flatulence problem. [5]

Dimethicone as an inactive chemical compound that is not absorbed from the intestine is used in many countries to help to relieve the symptoms caused by intestinal gases since 1960. [3] Moreover, other drug treatments such as Simethicone, activated charcoal in form of 250 mg large black tablets and metoclopramide are used in decreasing flatulence after surgery. [6] The majority of synthetic drugs used to reduce the flatulence have side effects thus greater attention is paid to the use of herbal medicines. [1] In spite of a suitable climatic condition for growing such plants in Iran, little research has been conducted and published. [7]

Today, 11-43% of patients with gastrointestinal complaints makes use of CAM therapies and considers them effective. [3] The use of herbal therapy was common since ancient times in ancient civilizations and today it is also common throughout the world in different forms such as the use of herbal products or their extracts and herbal therapy has gained a special attention in recent years. [8]

The use of herbs like peppermint essence has long been considered as Taylor (1985) in a study indicated peppermint essence effect on relaxing smooth muscles of the gastrointestinal tract. [9] In another study, Liu et al concluded that peppermint essence is effective in improving abdominal cramps. [10]

Mint is one of the edible vegetables with a warm nature. Peppermint essence is obtained from distillation of fresh flowers and twigs of peppermint. It is a liquid which is colorless or in pale yellow or greenish yellow with a pungent smell and taste which contains substances such as menthol, menton and menthyl acetate. [11] Peppermint has analgesic, antibacterial, anti-flatulence and anti-inflammatory effects. [7] Peppermint and its essence are well-known for their anti-flatulence effect. Although the exact mechanism of such an effect is unknown, it is likely to be due to the relaxation of the lower esophageal sphincter and the reduction of gas pressure in the stomach. [12]

Supermint oral drop is a new herbal medicine in Iran which belongs to the category of carminative drugs and has been prepared from peppermint plant essence with the scientific name of *Mentha spicata* belonging to the Lamiaceae family (mint family). In the product there exists an amount of 9.5 mg Carvon in the essence. [11] Overall, it is safe to consume peppermint plant, its essence and Phentol. [13] Medicinal herbs due to containing various active ingredients can be used in treatment of a variety of diseases and their symptoms. Each active ingredient in such herbs can have its own usage without the set of active ingredients influencing each other or interfering with each other. [14] Therefore, controlling flatulence by herbal medicines can have beneficial implications for patients. Ultimately, the aim of this study is to compare the effects of Supermint oral drop with Dimethicone chemical drug on the reduction of flatulence in patients with IBS referring to Imam Ali (A.S) and Imam Khomeini (RA) Clinics in Zabol County.

MATERIALS AND METHODS

This study, which is a single-blind clinical trial, is conducted to compare the effect of Dimethicone and Supermint oral drop on reducing flatulence in patients with IBS. For this purpose, 60 patients with IBS referring to Imam Khomeini (RA) and Imam Ali (A.S) Clinics in Zabol County with complaint of flatulence who had the inclusion criteria were selected using the target-based approach. The inclusion criteria were: having symptoms of flatulence (including belching, abdominal distention, gas disposal, abdominal cramps and nausea) for at least 3 months, no drug and smoking addiction, lack of other acute diseases, natural examinations of the abdomen and patient consent. [3] Patients who were not treated with other effective drugs against flatulence were selected for this study. Moreover, those participants who needed other medications in order to continue their treatment were excluded from the study. Furthermore, the exclusion criteria during the study included lack of patient consent

for the continuation of cooperation, lack of proper following of medication orders, lack of proper access to patients to assess the results as well as occurrence of side effects.

After applying the inclusion criteria, patients were banned to eat flatulent foods (such as peas, beans, milk, eggplant, cola and chewing gum during studying) and also to use other drugs without informing the researcher. After coding, the patients were randomly divided into two groups of A and B. The patients in group A were treated with Dimethicone and the patients in group B were treated with Supermint in a single-blind form and with the help of the doctor and without the researcher having the knowledge of the type of drug. The amount of consuming Supermint drop was determined to be 40 drops dissolved in 20 ml of tap water after each meal. Moreover, Dimethicone was prescribed with the common dose of a 40 mg chewable tablet after each meal. Duration of the use of medicines was determined to be 3 weeks for the patients. [3]

The severity of the symptoms was taken from the patients in 3 time intervals including at the time of admission, two weeks and four weeks after treatment (one week after discontinuation of the drug) through an in-person interview. [3] After obtaining a written consent, a personal information form was completed by the patient and after three in-person interviews, the VAS (Visual Analog Scale) graph was given to the patient and he was asked to sign off his flatulence severity on the graph (no flatulence: green, very low flatulence: blue, low flatulence: purple, average flatulence: yellow, almost severe flatulence: orange, severe flatulence: red). [2, 14] In a study that was conducted by Gholamrezai et al, the effectiveness of this assessment tool is shown in the investigation of the flatulence severity. (15) In the fourth week of the interview, the patient medication was revealed by asking him and side effects including skin sensitivity, headache and itching were recorded in both groups.

Ultimately, SPSS software package version 18 was used for statistical analysis. Statistical methods used in this statistical descriptive study were chi-square and repeat measurement test. At the beginning of the study, a written consent was received from the patients and they were free not to further cooperate at any time during the research process. In addition, the data of the subjects under study is kept confidential by the researchers and the researchers adhered to the principles of the Helsinki Convention at all stages of the study.

Findings:

The majority of the participants treated with Dimethicone had an age range between 26 and 50 years (13 patients (43%)) and the greater number of the participants in the group treated with Supermint were over the age of 51 years (12 patients (40%)). With regard to the gender, most participants in the group treated with Dimethicone were females (16 patients (53.3%)) and in the group treated with Supermint most participants were male (19 patients (63.3%)). The difference between age ($P = 0.1$) and gender ($P = 0.4$) in the two groups was not statistically significant. Chi-square test was used to investigate the duration of flatulence in the both groups. The exact result of Fisher's test showed that the difference between the flatulence duration among people treated with Dimethicone and treated with Supermint is no statistically significant ($P = 0.6$).

Table 1 - demographic characteristics of the participants in the study

| | Dimethicone | Supermint | |
|-----------------------------------|-------------|-----------|-------|
| Age 0 to 25 years | (%20)6 | (%23.3)7 | P=0.1 |
| 26 to 50 years | (%43)13 | (%36.7)11 | |
| greater than 51 | (%36.7)11 | (%40)12 | |
| Gender male | (%46.7)14 | (%36.7)11 | P=0.4 |
| female | (%53.3)16 | (%63.3)19 | |
| Flatulence duration 3 to 6 months | (%83.3)25 | (%76.7)23 | P=0.6 |
| 6 to 12 months | (%16.7)5 | (%23.3)7 | |

Table 2. Study of flatulence rate at the time of admission, two weeks after and four weeks after intervention in the both groups

| | | No flatulence (green) | Very low flatulence (blue) | Low flatulence (Purple) | Average flatulence (Yellow) | Almost severe Flatulence (Orange) | Severe Flatulence (red) | statistics |
|---------------------------------------|-------------|-----------------------|----------------------------|-------------------------|-----------------------------|-----------------------------------|-------------------------|------------|
| At the admission time | Dimethicone | (%0)0 | (%16.7)5 | (%23.3)7 | (%26.7)8 | (%26.7)8 | (%6.7)2 | P=0.2 |
| | Supermint | (%0)0 | (%20)6 | (%20)6 | (%30)9 | (%16.7)5 | (%13.3)4 | |
| Two weeks after the admission | Dimethicone | (%0)0 | (%6.7)2 | (%30)9 | (%23.3)7 | (%26.7)8 | (%13.3)4 | P=0.4 |
| | Supermint | (%0)0 | (%30)9 | (%33.3)10 | (%20)6 | (%13.3)4 | (%13.3)4 | |
| Four weeks after the admission | | low | | average | | severe | | P=0.01 |
| | Dimethicone | (43.3)13 | | (16.7)5 | | (40)12 | | |
| | Supermint | (76.7)23 | | (10)3 | | (13.3)4 | | |

To examine the flatulence on arrival for two groups, Chi-squared test was used. The results of the study showed no statistically significant difference ($p = 0.2$) in flatulence between two groups consuming Dimethicone and Supermint. Moreover, two weeks after the intervention, no significant difference was observed between Dimethicone and Supermint groups. ($p = 0.4$). But Fisher's exact test showed that there was statistically significant difference in flatulence after four weeks of the intervention between the two Dimethicone and Supermint groups and those who are using Supermint, compared to those who used Dimethicone, experienced less flatulence. ($p = 0.01$).

RESULTS AND DISCUSSION

Dimethicone as an inactive chemical compound which is not absorbed by the intestines is used in many countries to relieve the symptoms of intestinal gas. [2] Choen and Belsky in a study showed the favorable effect of Simethicone in patients with organic complaints. [16] Moreover, Brenstein and Shwartz' study represents the effectiveness of Simethicone in releasing the stomach gas. [17] The study also suggests the reducing severity of the flatulence caused by Dimethicone. This is consistent with the stated research.

Since the majority of drugs used to relieve abdominal pain and flatulence have side and harmful effects, they will mostly lead us to the use of herbal medicines. [2] Supermint oral drop is a new drug in the category of carminative drugs. [11] Liu et al. showed that the mint oil is effective in improving abdominal cramps. [10] Kingham also showed the effect of mint oil on the colon spasm. [18] Nash in a study showed that mint oil has a major impact on improving irritable bowel syndrome symptoms. [19] Vojdani et al. conducted a study in Iran. The results showed that, in comparison to placebo, mint oil can reduce pain in patients with bowel syndrome. [20] Taylor (1985) showed the dormitive effect of mint oil on gastrointestinal muscles. [9] Capello et al. in their study reported the effectiveness of treatment with peppermint oil in recovery of irritable bowel syndrome. [21] The current study also represents the mint impact on reducing the severity of emphysema in patients with irritable bowel syndrome. This is in line with the aforementioned studies.

In addition, Mamishi showed that Carmint (a mixture of mint oil, Lemon balm and coriander) has a positive effect on reducing the flatulence intensity after cesarean surgery. [22] Ebrahimi Daryani et al. showed that peppermint oil is more effective than placebo in improving abdominal pain, flatulence and reducing the frequency of defecation. [23] Qadir and Qanooni, in their study, mentioned that mint, Lemon balm and coriander are effective in the treatment of irritable bowel syndrome. [24] Shahdadi et al study showed which supermint decrease pain in appendectomy patients [25] these are consistent with the findings of the current study. However, it seems that little research has been conducted on the impact of Supermint on flatulence and more studies need to be carried on. In this study as a comparative study of the effects of Dimethicone and Supermint on reducing flatulence in patients with IBS, it was shown that no significant difference was observed between the use of Dimethicone and Supermint over the second week of drug use; however, the effect of Supermint over the fourth week of the drug use (one week after drug stopping) was more than that of Dimethicone.

CONCLUSION

The results of the study show that both Dimethicone and Supermint are effective in reducing flatulence of patients with IBS; however, no significant difference was observed between the use of Dimethicone and Supermint over the second week of drug use. Moreover, the effect of Supermint over the fourth week of the drug use was more than that of Dimethicone. Therefore, it seems that flatulence control in patients with IBS and due to limitations of Supermint side effects can have beneficial consequences for patients with irritable bowel syndrome.

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