



A Study of Antidiarrhoeal Effects of Nutmeg

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Accepted on: 25-12-2014; Finalized on: 28-02-2015.

ABSTRACT

Recurrent diarrhoea is prevalent in developing countries, particularly in tropical regions. The antidiarrhoeal effect of Nutmeg (*Myristicafragrans*), a herbal medicine traditionally used as antidiarrhoeal remedy, was studied using rat models of diarrhoea induced by castor oil. Total 18 albino rats were included in this study. They were divided equally into 3 groups. Group 1 (control group) received no protecting drug before castor oil challenge, group II received Nutmeg crude suspension in the dose of 100mg/kg orally and group III received Nutmeg crude suspension in the dose of 200 mg/kg orally. After 3 hours, castor oil was administered orally and observations were tabulated. The test solution 100 mg/kg group showed a slight decrease in diarrhoea score and the test solution 200 mg/kg group showed marked decrease in diarrhoea. The total count of feces discharged during 5 hours after castor oil administration showed a decrease in both the test solution 100 mg/kg and 200 mg/kg groups. The results of our study indicate that Nutmeg possesses antidiarrhoeal effect and thus its use in traditional medicine is justified.

Keywords: Nutmeg, *Myristicafragrans*, Diarrhoea.

INTRODUCTION

Diarrhoea can be diagnosed clinically when the frequency of defecation is more than 4 times per day and the weight of stool per day is higher than 250g. Chronic diarrhoea is defined as diarrhoea persisting for more than 2-3 weeks in adults, whereas acute diarrhoea refers to recently occurred diarrhoea which hasn't reached that duration yet¹.

Acute diarrhoea is mainly caused by pathogenic microorganisms and drugs, and chronic diarrhoea is much more diverse in its causes, including irritable bowel syndrome, chronic inflammatory bowel diseases, post-operation, malabsorption, and pathogenic microorganisms, in order of frequency¹.

In oriental medicine, diarrhoea has been mentioned in various terms. Depending on the severity and duration, diarrhoea is classified into fulminant diarrhoea which belongs in the excessive pattern and chronic diarrhoea which belongs in the deficient pattern, and both types share the pathogenic mechanism of excess dampness and spleen deficiency².

When acute diarrhoea progresses into chronic diarrhoea, the differential diagnosis becomes complicated and efficient treatment becomes difficult, so it is important to come up with a herbal prescription which can swiftly resolve the diarrhoea at an early stage.

Recurrent diarrhoea is prevalent in developing countries, particularly in tropical regions. A natural based antidiarrhoeal home remedy can serve as an ideal health tool to limit diarrhoea-related morbidity and mortality^{3,4}. In the traditional Indian medical science of Ayurveda, nutmeg is one such plant said to possess antidiarrhoeal

activity. Nutmeg seed is widely used as a spice. In India it is mainly cultivated in South India particularly in certain pockets of Kerala, Tamil Nadu and Karnataka. It has a characteristic pleasant fragrance and slightly warm taste. It is used to flavour many kinds of baked goods, confections, puddings, meats, sausages, saucers, vegetables, and beverages⁵. Nutmeg is the dried seed kernel of *Myristicafragrans* belongs to the family Myristicaceae. It is commonly known as Jaiphal and Javitri in India^{6,7}. In the traditional Indian medical science of Ayurveda, nutmeg is one such plant said to possess antidiarrhoeal activity⁸. It is used as an active ingredient of most of the ayurvedic antidiarrhoeal formulations. A study was therefore planned to assess the antidiarrhoeal effect of nutmeg.

MATERIALS AND METHODS

In this study, we investigated the antidiarrhoeal properties of Nutmeg (*Myristicafragrans*), by observing the effect of Nutmeg on rat models of diarrhoea induced by castor oil. This study was done in the department of pharmacology at Gandhi Medical College, Bhopal, MP.

Crude Nutmeg Suspension (Triturated)

Four gram of Nutmeg (freshly powder) was taken. This coarse powder was triturated with a known amount of water to make a thick paste of uniform consistency. The volume was finally made to 100 ml. Thus each ml of the suspension contained 40 mg nutmeg.

Experimental Animals

The animals used in this study were Albino rats weighing approximately 200g. The animals were used after 2 weeks of adaptation period while being fed with solid feed and



ample water. The experiments were conducted at 24 ± 2 Celcius.

Experiments on Antidiarrhoeal Effects by Castor oil test.

The castor oil test in the rat has been used extensively in laboratories as a basic pharmacological test to screen and evaluate antidiarrhoeal drugs.

Ricinoleic acid, the active component of castor oil produces the intestinal stimulant effect.

Total 18 albino rats were included in this study. They were divided equally into 3 groups. Group 1 (control group) received no protecting drug before castor oil challenge, group II received Nutmeg crude suspension in the dose of 100mg/kg orally and group III received Nutmeg crude suspension in the dose of 200 mg/kg orally.

After 3 hours, 45% castor oil (solvent: olive oil) 0.1ml/10gm was administered orally.

Each rat was kept separately in a case, the bottom of which was covered by thick white paper.

The cages were examined and the observations were tabulated after castor oil challenge.

Table 1: Effect of Nutmeg on diarrhoea induced by Castor oil in rats.

Group	Dose	No. of Rats	Number of feces in 5 hour	
			Total no. of feces	Average no. of feces per rat
Group I	----	6	76	12.66
Group II	Nutmeg crude suspension 100 mg/kg	6	55	9.16
Group III	Nutmeg crude suspension 200 mg/kg	6	49	8.16

OBSERVATION AND RESULTS

The effects of the test solution on castor oil- induced diarrhoea were observed as shown in Table 1.

The test solution 100 mg/kg group showed a slight decrease in diarrhoea score and the test solution 200 mg/kg group showed marked decrease in diarrhoea.

The total count of faeces discharged during 5 hours after castor oil administration showed a decrease in both the test solution 100 mg/kg and 200 mg/kg groups.

DISCUSSION AND CONCLUSION

Diarrhoea is a common condition frequently seen in clinical practice.

Strict definition of diarrhoea is difficult due to the individual differences in defecating habits, but it is generally defined as: frequent defecation more than 3 times a day, loose and formless stool, or an abnormal increase in the total amount and water content of stool.

Diarrhoea can include gastrointestinal complications such as fever, abdominal pain, or vomiting.

It is related to an imbalance in the regulation of absorption and secretion in the intestine, and its causes are diverse^{1,9,10}.

The mechanisms of diarrhoea are explained as the following:

1. Hypermotility of the intestine leading to rapid transport of intestinal content and keeping water from being properly absorbed.
2. Lesions in intestinal mucosa leading to malabsorption of water.
3. Hypersecretion in the intestinal mucosa leading to hypertonic intestinal contents irritating the mucosa.

There are many causes of diarrhoea: endotoxins from bacterial infection, viral infection, mucosal damage from food, food intolerance such as lactose intolerance, drugs such as antibiotics and hypertension medication, gastrointestinal disorders such as inflammatory bowel disease, irritable bowel syndrome, etc.^{1,9,10}.

Severe diarrhoea can cause loss of water and minerals, and can result in grave complications such as spasms, central nerve system stimulation, or malnutrition, thus the use of antidiarrhoeals is important.

Antidiarrhoeals refer to drugs which act on the intestines and stop the diarrhoea, and can be classified to antimotility agents, antibiotics, absorbents, astringents, and bacterial replacements^{9,10}.

Many herbal prescriptions are being used in the treatment of diarrhoea, and there have been experimental studies on the antidiarrhoeal effect of herbal medicine using animal models.

In the traditional Indian medical science of Ayurveda, nutmeg is one such plant said to possess antidiarrhoeal activity.

The results of our study indicate that Nutmeg possesses antidiarrhoeal effect may be due to its antimotility and antisecretory effect and thus its use in traditional medicine is justified.

Antimotility and antisecretory effect of Nutmeg may be due to the presence of different phytochemicals.

Further study is required to find out the active constituents responsible for its antidiarrhoeal effect.

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Source of Support: Nil, Conflict of Interest: None.

