

## Effect of Peppermint Essence on Satisfaction of Patient and Medical Team with Pediatrics' Endoscopic Examination of Gastrointestinal (GI) System

Mohammad Ali Kiani<sup>1</sup>, Ali Ghasemi<sup>1</sup>, Elham Poursoltani<sup>1</sup>, Bibi Leila Hoseini<sup>2</sup>,  
Hamid Ahanchian<sup>1</sup>, \*Masumeh Saeidi<sup>3</sup>

<sup>1</sup> Department of Pediatrics, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

<sup>2</sup> Midwifery MSc, Midwifery Department, Nursing and midwifery school, Sabzevar University of Medical Sciences, Sabzevar, Iran.

<sup>3</sup> Students Research Committee, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

### Abstract

#### Introduction

Endoscopic examination of gastrointestinal (GI) system is a diagnostic and therapeutic instrument in children. Endoscopy usually encounters some difficulties because of intensive and spastic response of GI muscles during endoscopic examination. So this study aimed to assess the effect of peppermint essence on satisfaction of patient and therapeutic team during endoscopic examination.

#### Materials and Methods

This clinical trial study was conducted on 120 children less than 14 years who affected to pyloric spasm under endoscopy. Patients were randomly divided into two groups. Control group (n=60) received placebo and case group (n=60) received peppermint essence. Data were analyzed by descriptive- analytic (Mann-Whitney test, T-test, correlation) statistics and using SPSS 11.5.

#### Results

More than half of case groups (73.3%) were satisfied with endoscopy process, while 51.6% of control group were dissatisfied. Mean of endoscopy duration time was  $9.30 \pm 0.35$  min in peppermint group and  $10.14 \pm 0.34$  min in control group; which it had a significant difference in two groups ( $P < 0.05$ ). Mean duration time of pylorus spasm relaxation was less than 60s in case group, while it took time more than 60s in 60% of control group ( $P < 0.05$ ).

#### Conclusion

Findings showed that peppermint administration to children during endoscopy caused to improve satisfaction of endoscopy team. It also caused to reduce duration time of endoscopy and pyloric spasm.

**Keywords:** Children, Endoscopy, Peppermint, Satisfaction.

#### \*Corresponding Author:

Masumeh Saeidi, Mashhad University of Medical Sciences, Mashhad, Iran.

E-mail: Masumeh\_Saeedi@yahoo.com

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## Introduction

Endoscopic examination of gastrointestinal (GI) system is a diagnostic and therapeutic instrument in children. Endoscopy usually encounters some difficulties in children, because of intensive and spastic response of GI muscles under endoscopic examination. Upper endoscopy, which is also called Esophagogastroduodenoscopy (EGD), is a procedure for examining the esophagus, stomach, bulb and second portion of duodenum by a flexible endoscope. This instrument is the best method of examining mucosa of upper GI (1- 5).

One of the most common difficulties in pediatrics' endoscopy is pyloric spasm. Pyloric spasm is excessive response and contraction of muscles in pylorus region under endoscopy. Different methods and comments have been suggested to resolve these difficulties of endoscopy. Herbal medicine has been considered as a therapeutic method from ancient period and also in recent years. Plant extracts have been used for pain relief. Several studies have been conducted on plant extracts worldwide. In spite of suitable climate of Iran for growing the plants, limited researches have been conducted on these plants (6-8). Peppermint is an aromatic herb, with a spicy and cooling taste that grows in different regions of Iran. Peppermint has analgesic, anti-bacterial, carminative and anti-inflammatory effect (9-11). Peppermint essence contains chemicals, including terpinolene, osmyl, terpinene and Methyl (9-10). In a multi-center study, it was shown that L-menthol, which is abundant in peppermint, with a concentration of  $\geq 0.8\%$  is a more effective substance than placebo to reduce spasm under endoscopy (12). Liu confirmed that L-menthol spray is effective on stomach mucosa in preventing peristalsis (13). Kingham showed that peppermint essence cause to reduce abdominal pain via decreasing spasm of GI smooth muscles (14). Hikichi et al. showed that peppermint caused to better endoscopic diagnosis of gastric lesions (15). Hiki et al. assessed the efficacy and safety of

L-menthol sprayed onto the gastric mucosa during upper gastrointestinal endoscopy. They determined that peppermint is very effective in preparation for endoscopy (16). May showed that peppermint improved the signs of non-ulcer dyspepsia, significantly (14). Imagawa reported peppermint as an antispasmodic drug in elderly patients during EGD (13). Several showed that peppermint essence relieves pain in patients affected to Irritable bowel syndrome (IBS) (18-21). So this study aimed to assess the effect of peppermint essence on satisfaction of patient and therapeutic team during endoscopic examination.

## Materials and Methods

This clinical trial study was conducted on 120 children who referred to pediatrics unit of Qaem Hospital, Mashhad-Iran from May 2012 to November 2013. Sampling method was purposive sampling. Sample size calculated 60 for each group, according to the previous studies, with considering  $\alpha=0.05$  and  $\beta = 0.2$ .

Inclusion criteria were children less than 14 years old, who required endoscopy of upper GI due to any reason. Exclusion criteria were patients affected to liver disease and gastroesophageal reflux. The study was confirmed by Ethics Committee of Mashhad University of Medical Sciences (MUMS). Then, patients were randomly divided into two groups. Control group (n=60) received placebo and case group (n=60) received peppermint essence.

Data were analyzed by descriptive- analytic (Mann-Whitney, t-test, correlation) statistics and using SPSS 11.5.  $P<0.05$  was considered significant.

## Results

Two groups were homogenous, i.e. there was no significant difference between two groups with regard to some variables such as gender and age; so that 55% (n=33) of participants in control group, and 51.7%

(n=31) in case group were female. (Table.1) describes distribution of children age.

In case group, 18 patients had total satisfaction with endoscopy process, while just 1 patient had total satisfaction with it in control group. In opposite, 31 patients of control group were dissatisfied with endoscopy process, while just 3 children were dissatisfied with it in peppermint group. Totally, satisfaction of endoscopy team with endoscopy process in peppermint group was significantly higher than control group ( $P < 0.000$ ) (Table.2).

Mean of endoscopy duration time was  $9.30 \pm 0.35$  minutes in peppermint group and  $10.14 \pm 0.34$  minutes in control group; which it had a significant difference in two groups ( $P < 0.05$ ).

Pylorus valve opening had a significant difference in two groups ( $P = 0.000$ ) (Table.3). Findings showed that mean duration time of pylorus spasm relaxation was lower than 20 seconds in 26 patients of peppermint group versus 2 patients of control group ( $P = 0.009$ ) (Table. 4).

Table.5 shows distribution of associated processes with endoscopy in two groups. There was no significant difference between two groups in this regard ( $P > 0.05$ ).

**Table 1:** Frequency of children age groups in two participating groups

Age (year)	Group	
	Case	Control
1-5	21.6%	23.3%
6-10	45%	40%
11-14	33.4%	36.7%

**Table 2:** Frequency of patients satisfaction with endoscopy process in two participating groups

Group	Satisfaction with endoscopy			
	Dissatisfied	Moderate	Good	Totally satisfied
Case	3.3%	20%	43.3%	30%
Control	51.6%	40%	6.6%	1.6%

**Table 3:** Frequency of Pylorus valve dilation in two participating groups

Pylorus valve opening	Control	Case	P-value
Totally open	5%	48.3%	0.000
Relatively open	48.3%	43.3%	
Close	46.7%	8.3%	

**Table 4:** Mean duration of pylorus spasm relaxation in two participating groups

Duration of relaxation	Control	Case	P-value
<20 s	2(3.3%)	26(43%)	0.009
20-40 s	8(13.3%)	24(40%)	0.006
40-60 s	14(23.3%)	10(16.6%)	0.76
60 s<	36(60%)	0(0%)	0.000

**Table 5:** Distribution of associated processes with endoscopy in two groups

Associated processes with endoscopy	Control	Case	P value
Esophageal biopsy alone	2 (3.3%)	1 (1.6%)	0.976
Gastric biopsy alone	2 (3.3%)	3 (5%)	0.872
Duodenal biopsy alone	4 (6.6%)	6 (9.9%)	0.697
Without any biopsy	5 (8.3%)	7 (11.6%)	0.714
Esophageal & gastric biopsy	5 (8.3%)	3(5%)	0.498
Duodenal & gastric biopsy	12 (19.8%)	7 (11.6%)	0.711
Duodenal & Esophageal biopsy	6 (9.9%)	8 (13.3%)	0.911
Biopsy of third parts	24 (37.6%)	25 (41.6%)	0.136

Findings showed that required duration time was 487.5 second for endoscopy without any biopsy, and 555 second for endoscopy associated with esophageal, gastric and duodenal biopsy was.

## Discussion

The present study showed that peppermint essence administration improves satisfaction of endoscopy team in pediatrics. The researches have shown that peppermint plant causes to muscle relaxation (22). Vejdani et al. concluded that application of peppermint essence for 8

weeks relieves patients' pain in people affected to Irritable bowel syndrome (IBS) in comparison with placebo (23). Studies showed that peppermint causes to reduce calcium flow by affecting on calcium canals present in neurons. Stimulation of neurons causes to synapse transition, in this way pain reduces (24). Another study conducted in Sheffield University showed that peppermint oil is effective on pain reduction and patient satisfaction (25). In a similar clinical trial double-blind study with a placebo group, was conducted on 65 patients under colonoscopy, administration of peppermint oil capsule reduced spasm and improved specialist's satisfaction during colonoscopy, significantly (26). In Japan, a study was done on two control (n=215) and case (n=215) groups. Case group received oral peppermint oil and control group received nothing. Findings showed that peppermint caused to reduce spasm in esophagus, lower stomach, and bulb of duodenum. Furthermore, it prevented from barium flow to end part of duodenum and improved the quality of diagnosis without using antispasmodics (27). Imagawa et al. (2012) compared peppermint oil with antispasmodic drugs hyoscine butyl bromide and glucagon on upper GI endoscopy in elderly patients. They showed peppermint is effective for reduction of spasm during endoscopy (18). The mentioned studies were in consistent with the present study in relation to satisfaction of endoscopy team. May reported that 4 patients encountered with complication, which severity of complication caused to cease peppermint just in one patient (17). In contrast, in the present study and many previous studies, nobody encountered any complication. This indicates that peppermint is a relatively safe substance in children. One of the present study limitations was that we could not assess peppermint complications in this study. So, conducting researches with

assessment peppermint complications and a more sample size is suggested for future studies.

### Conclusion

Findings showed that peppermint administration improved satisfaction of endoscopy team. It also caused to reducing duration time of endoscopy and pyloric spasm.

**Conflict of Interest:** The authors declare that they have no competing interests.

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