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Letter to the Editor

## Efficacy of abdominal massage with mastic gum oil on gastroesophageal reflux disease symptoms of infant: a randomized controlled trial



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Gastroesophageal reflux disease (GERD) still remains one of the most common digestive disorder in neonates and infants.<sup>1,2</sup> There are several non-pharmacological and pharmacological therapies for GERD, however, most of them have limited efficacy, also the long-term use of antacids and proton pump inhibitors have some side-effects including diarrhea, constipation, headache and nausea.<sup>3</sup> Consequently, there is a growing trend towards using complementary and alternative medicine worldwide. The aim of this study was to the effect of mastic oil massage on treatment of GERD in infants according to “*The Canon of Medicine*”.<sup>4</sup>

A total of 90 infant aged between one months to one year were included in the present study, diagnosis by a pediatric gastroenterologist according to GERD Symptom Questionnaire-Infant (GSQ-I) during the last seven days.<sup>5,6</sup> The participants were assigned into two groups of 45 patients using the block randomization method. The experimental group received omeprazole (20 mg/12 h) and abdominal massage with mastic gum oil (every 12 h), while control group received omeprazole capsules

(20 mg/12 h) and abdominal massage without oil (every 12 h) for 2 weeks. The mother or nurse performed the abdominal massage clockwise around the navel and stomach for 10 min, approximately half an hour after the infant was fed (with milk or other food).

The outcome measures were regurgitation and irritability, arching back and withdrawal, choking/gagging, and refusal to feed. Data were collected using the Global Severity Questionnaire (GSQ), which assesses the severity and frequency of each of the most common symptoms by age in the past 7 days, before and 1, 2 and 4 weeks. Data were analyzed in SPSS Statistics for Windows, version 16.0. Comparative tests such as the repeated measures analysis and ANOVA were employed to compare treatment outcomes in different weeks of intervention.

Of fifty-four girls and thirty-six boys participated in this study and seventy-three participants completed the study. Eight patients in experimental group were discontinued the intervention because of side effects including skin allergy (6), restlessness (1), and diarrhea (1), while nine participants were excluded from analysis not regular participation of abdominal massage. There were no statistical differences between two groups in age, gender, and gastrointestinal complication in the mother (Supplement 1). In

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**Table 1**  
Change in CSS and ISS at Baseline, 1 and 2 Weeks after Treatment, 1 and 4 Weeks' Follow-up.

Outcomes	Baseline	1 week	2 weeks	1 week follow-up	4 weeks follow-up
CSS scores					
Massage with oil	64.91 ± 42.10	33.38 ± 24.14	24.16 ± 23.10	32.54 ± 24.29	33.24 ± 24.10
Massage only	51.64 ± 28.25	41.78 ± 25.88	37.83 ± 26.56	38.50 ± 27.56	38.39 ± 27.73
Regurgitation (ISS)					
Massage with oil	10.82 ± 11.24	5.97 ± 7.70	4.27 ± 7.22	5.86 ± 7.67	6.13 ± 7.63
Massage only	9.31 ± 11.80	7.24 ± 8.89	6.52 ± 8.89	6.77 ± 10.14	6.91 ± 10.56
Irritability/fussiness (ISS)					
Massage with oil	11.44 ± 10.17	5.81 ± 4.41	4.89 ± 5.00	6.18 ± 5.03	5.94 ± 5.06
Massage only	11.66 ± 1.21	8.56 ± 9.28	8.13 ± 9.52	8.58 ± 10.10	8.52 ± 10.08
Arching back (ISS)					
Massage with oil	14.35 ± 12.45	6.91 ± 6.71	4.78 ± 6.09	6.48 ± 6.68	6.51 ± 6.66
Massage only	10.00 ± 8.38	8.18 ± 7.60	0.61 ± 7.75	7.30 ± 6.72	7.25 ± 6.69
Choking/gaging (ISS)					
Massage with oil	7.17 ± 8.04	3.78 ± 5.95	2.40 ± 4.59	3.67 ± 5.75	3.67 ± 5.75
Massage only	5.44 ± 6.07	4.45 ± 5.73	4.11 ± 5.80	4.16 ± 5.82	4.16 ± 5.82
Refusal to feed (ISS)					
Massage with oil	11.35 ± 9.85	6.16 ± 6.27	4.40 ± 5.70	5.89 ± 6.27	6.18 ± 6.27
Massage only	7.57 ± 5.04	6.48 ± 4.59	6.11 ± 4.79	6.25 ± 4.86	6.11 ± 4.67
Episodes of hiccup (ISS)					
Massage with oil	9.35 ± 11.60	4.78 ± 6.92	3.62 ± 5.92	4.48 ± 6.74	4.54 ± 6.76
Massage only	7.66 ± 9.66	6.56 ± 10.09	5.02 ± 9.00	5.16 ± 8.98	5.16 ± 8.98

CSS, Composite Symptom Score: the sum of the ISS values; ISS, Individual Symptom Score: the score from multiplying the severity and the frequency of each symptom.

both groups, the mean composite symptoms score (CSS) decreased significantly over time without a statistically significant difference between the groups (Table 1). In both groups, the individual symptom score (ISS) values decreased during the two weeks of treatment. ISS and CSS increased in the first and fourth weeks of follow-up but did not reach baseline levels. This can be due to the short course of treatment, and we need to increase the treatment period.

In this study, ISS and CSS, as two measures of the reflux symptoms, reduced in the both groups after treatment, indicating that the treatment was effective in both groups. However, there were no significant difference between the two groups. The abdominal massage with mastic oil may not be more effective than massage only. However, more extensive studies with larger sample sizes and longer treatment durations are recommended.

#### Author contributions

Conceptualization: HMK and MA. Investigation: MS and HMK. Formal Analysis: MS and HMK. Writing - Original Draft: AG, ZR, and SN. Writing - Review & Editing: MA, NK, and HMK.

#### Conflict of interest

There are no conflicts of interest to declare.

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#### Ethical statement

This study was approved by the Iran University of Medical Sciences (Code of Ethics: IR. IUMS.REC1396.9421309001) and is

registered in the Iranian Registry of Clinical Trials (identifier: IRCT20180406039204N1).

#### Data availability

The data related to this study are provided as supplementary materials. Other data will be available upon request.

#### Supplementary materials

Supplement 1. The basic characteristics of infants, and Supplement 2. The raw data, can be found in the online version, at doi:<https://doi.org/10.1016/j.imr.2020.02.004>.

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