

The Comparison of the Effects of Massaging and Rocking on Infantile Colic

Abstract

Introduction: Infantile colic is a painful condition in the first months of infancy. This study was carried out with the aim of testing the hypothesis that massage treatment has a clinically relevant effect on this condition. **Materials and Methods:** This randomized clinical trial was conducted among 100 infants of <12 weeks of age with infantile colic. They were randomly assigned to either infant massage ($n = 50$) or rocking groups ($n = 50$). In the massage group, trained individuals taught the parents of the infants the massage technique and gave them a brochure. Rocking group parents was recommended to rock their infants three times a day for 1 week. Parents recorded the pattern of crying (numbers, length, and severity of crying). After 1 week of intervention, data were analysed using t -test, Chi square test, and repeated measurement analysis of variance ($P < 0.05$). **Results:** Significant differences were not observed in infant and mother demographic information. Before intervention, the mean of total number, length, and severity of crying were 6.12 (1.76) time/day, 4.97 (1.37) hour/day, and 6.60 (1.54) in the massage group and 6.96 (2.9) time/day, 3 (1.31) hour/day, and 5.98 (2.22) in the rocking group, respectively. After 1 week of intervention, the mean difference of total number, length, and severity of crying were 4.08 (1.83) time/day, 2.81 (1.77) hour/day, and 2.9 (2.37) in the massage group and 0.56 (2.28) time/day, 0.27 (1.09) hour/day, and 0.02 (1.64) in the rocking group, respectively. **Conclusions:** This trial of massage treatment for infantile colic showed statistically significant or clinically relevant effect in comparison with the rocking group.

Keywords: Colic, infant, massage, rocking

Introduction

Infantile colic is one of the relatively prevalent disorders of infancy, affecting 10–40% of infants;^[1] in Iran, its prevalence has been estimated to be 20%.^[2] Infantile colic is a behavioral syndrome in which intense crying without any known reasons is observed in healthy infants less than 3 months of age. According to Wessel's criteria, the diagnostic criterion of colic is defined as "periods of crying lasting more than 3 hours a day, more than 3 days a week for more than 3 weeks." In the case of colicky infants, cries and screams begin at a specific time of the day, usually being heard in the afternoon, in the evening, and at night.^[3,4]

The new-borns' cries, screams, and moans have highly destructive effects not only on the infants but also on the parents, particularly the mothers who are going through the sensitive period of postpartum. It has been proven that infantile colic is

associated with postpartum depression and mothers' anxiety and stress.^[5-8]

Although the cause of colic still remains unknown and an effective treatment has not been yet found, there are various behavioral and the organic theories^[9] in this regard. The theory of the behavioral cause (or the socio-psychological theory) includes insufficient interaction and bonding between the infant and his/her mother as well as mother's anxiety and stress. The theory of the organic cause includes inappropriate function of the digestive system and allergic reactions in infants.^[9]

Different treatments are recommended for colic such as modification of diet and physical, behavioral, and pharmaceutical treatments. However, not all of them have always been effective.^[10] In addition, complementary and alternative treatments for infantile colic have been suggested, including rocking the infant, singing, warm towel, and massage therapy.^[3,9,11,12] Massage

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is, in fact, a series of orderly movements performed on different parts of the body by a trained person in a harmonic fashion for specific goals. Massage can relieve stress on muscles and internal organs and can result in the stimulation and improvement of the blood circulation in tissues and organs.^[13-15] Because colic results from colon muscle spasms and decrease in the peristalsis, massage can probably relieve colic by increasing its movements and boosting the blood circulation.^[10] On the other hand, vibrotactile stimulation of massage by the mother on the infant's body surface leads to a reduction in the maternal-infantile stress and an increase in their contact,^[13] which can treat infantile colic according to the theory of the behavioral cause of colic.^[14] In addition, massage can relieve the symptoms and pacify the infant through helping him/her to sleep better.^[15-18]

Some studies have examined the effectiveness of massage in the treatment of infantile colic.^[9,11,12] A study conducted by Arikan *et al.* suggested that massage can be effective in relieving the symptoms of colic in infants.^[9] Other studies also showed the positive effects of massage on the reduction of colic symptoms.^[1,11] In another study carried out by McClure, it was shown that massage can lead to pacification of an infant, improvement of sleep, and help keep infantile colic in check or treat it.^[19] However, in several other studies, no relation was found between massage and reduction of the symptoms of colic.^[11,12,20] In a study conducted by Huhtala *et al.* it was found that massage does not prioritize other behavioral treatments for relieving the symptoms of infantile colic.^[11] In addition, many studies on the effectiveness of traditional treatments in colic have suggested that, in many parts of the world, massage is used as a traditional treatment for relieving the symptoms of colic.^[1,6,17,21]

Considering the various results and studies, infantile colic is an irritating problem for both the parent and infant, and its treatment should be one of the health care objectives. Therefore, we carried out a randomized controlled trial with the aim to test the hypothesis that such manual massage treatment is more effective than baby rocking in infantile colic.

Materials and Methods

This clinical trial study considered 100 infants less than 12 weeks of age who were admitted in the pediatric clinic of AmirKabir Hospital (Arak, Iran, 2011) because of infantile colic. The infants were randomly categorized in two groups, namely, infant massage treatment and infant rocking group.

We recruited healthy term infants less than 12 weeks of age with infant colic defined by the modified Wessel's criteria of crying or fussing for 3 hours or more a day for 3 days or more than 7 days, without any known diseases, any medical treatment for colic, any proven gastrointestinal

diseases, without lactose intolerance and allergies to milk, non-smoker mothers during pregnancy, and any infant skin problems or any limitations for receiving massage.

Participants were excluded if they used traditional and medical treatment during the study (such as sugar dissolved in hot water and herbal sprits), severe anxiety in the mothers according to the Zung criteria, and failure in performing the intervention correctly.

After obtaining written permission from the ethics committee of the University, we selected the participants according to the inclusion criteria of the study. Invitation letters were then sent out for participation in the study. The researcher provide a full explanation of the study, and obtained written consent from the parents of infants. Next, the questionnaire was filled out through interviews by the researcher. The questionnaire contained questions on demographic information of the infant (age, gender, birth weight, weight during the visit, and the type of diet), the mother (age, number of children, the type of delivery of the infant, and the dietary habits in terms of using flatulent foods), and the infant's colic symptom (the number of occurrence, length, and severity of crying within the last day); it was filled out by the researcher through interviews.

In addition, the Zung anxiety forms were distributed among the mothers and they were asked to fill it during their first visit. This scale was utilized to assess the mother's anxiety over the previous week. Mothers whose scores were indicative of severe anxiety were excluded from the study.

Infants' mothers in the massage group were instructed on standard techniques of massage by one of the researchers who had an infant massage license. In addition, the researcher provided the mothers with an illustrated pamphlet containing the stages and techniques of massage. Mothers were also asked to apply baby oil to prevent any damage to the skin of the infants (baby oil was given to mother by researcher). They were asked to massage their infants for 15–20 minutes once during the day and once at night before sleeping for 1 week. They were asked to record the crying pattern such as the number, length, and severity of cries (with McGill pain scale 1–10) as well as length of sleep in a checklist during the 7 days of intervention and register any side-effects during this period.

In the rocking group, mothers were asked to embrace their children and rock them gently when the symptoms of colic appeared and to register the specifications of symptoms of colic in the same checklist. Mothers were supposed to perform this 3 times a day for 5–25 min each time as soon as the symptoms of colic began to appear.

On the 8th day, they visited again for examination of the infants and delivering the checklists to the researcher. For analyzing the findings, we used the software program Statistical Package for the Social Sciences version 18 for the statistical analyses with the descriptive methods including

frequency, mean, and standard deviation; methods of data analysis included different types of *t*-test, Chi square test, and repeated measurement analysis of variance ($P < 0.05$).

Ethical considerations

The present study was conducted after obtaining written permission from the ethics committee of the International Branch of Shahid Beheshti University of Medical Sciences on August 15, 2010(116/1769) and it was registered in the Iranian Registry of Clinical Trials with ID number: IRCT. IRCT201106054317N5.

Results

The findings revealed that the infants' demographic information did not show any significant difference between the two groups of infants [Table 1].

In terms of the dietary habits of the infants, findings revealed that most of the infants were being breast-fed (92% in the massage group and 90% in the rocking group). The result suggested that there was no significant difference between the infants' dietary habits in the two groups. In terms of the type of delivery, in both the massage and rocking groups, a high percentage of infants had been delivered naturally and both the groups were homogenous in this regard. There was no significant statistical difference between the two groups in terms of delivery. The demographic data of the mothers whose infants suffered from colic pain in both the massage and rocking groups did not show any significant differences [Table 1].

The mothers' diet in terms of using flatulent and non-flatulent foods indicated that 84% ($n = 42$) of the mothers in the massage group and 62% ($n = 31$) in the rocking group did not use flatulent foods; there was no significant difference between the two groups. With regard to the mothers' anxiety, the majority of mothers fell into

the minor-to-moderate degrees of anxiety in groups, 42% ($n = 21$) in massage group and 38% ($n = 19$) in rocking group. There wasn't any significant difference.

Comparison of the distribution status of the infantile colic symptoms and the pattern of number of crying, length of crying and sleeping, and score of cry severity before the intervention and on the first and the last days of intervention in both the massage and rocking groups are presented in Table 2. Table 3 includes the pair-wise comparison for the variable time.

Discussion

The trial showed a significant mean difference in terms of crying pattern between the first and last days of intervention in the both the massage and rocking groups. The mean of number, length, and severity of crying decreased in both the groups, however, the mean difference of all crying pattern's criteria in the massage group was more considerable.

Alvandi *et al.* showed that the highest number of crying before the therapeutic touch reached 8 and after that dropped to 6 within 24 hours.^[22] However, the number of crying increased after manipulation in the control group. The findings of the present study are consistent with those of Alvandi *et al.* in terms of occurrence of crying.

Statistically, there was a significant difference between the length of crying on the first and the last day in the massage and rocking groups. In a study conducted by Olafsdottir *et al.*, the average length of crying of the colicky infants fell from 5.1 to 3.1 hours per day in the chiropractic spinal manipulation and from 5.4 to 3.1 hours per day in the placebo control group. The difference is not statistically significant. The study argued that the cause of alleviation of the colic symptoms in both the groups had been the support for and comprehensive training of the parents, which could

Table 1: Demographic information in the massage and rocking groups

Demographic information	Group		P
	Massage (n=50)	Rocking (n=50)	
Infant			
Sex (%)			
Male	29 (58)	23 (46)	0.23
Female	21 (42)	27 (54)	0.23
Age (weeks), mean (SD)	4.32 (3.24)	4.8 (3.55)	0.48
Weight in admission (g), mean (SD)	4121.20 (986.03)	4142.8 (1028.23)	0.91
Birth weight, mean (SD)	3229.20 (509.89)	3383 (843.51)	0.27
Mother			
Age (year), mean (SD)	26.90 (3.87)	27 (4.50)	0.9
Obstetric history			
Pregnancy number	1.56 (0.64)	1.86 (1.07)	0.09
Delivery number	1.44 (0.58)	1.58 (0.83)	0.3
Abortion number	0.12 (0.33)	0.26 (0.60)	0.2
Live children	1.42 (0.54)	1.58 (0.83)	0.3

SD: Standard deviation

Table 2: Comparison of infantile colic symptoms (number and length of crying and sleeping) before and after intervention in both the massage and rocking groups

Colic symptoms	Group						P
	Massage (n=50), mean (SD)			Rocking (n=50)			
	Before intervention	1 st day of intervention	Last day of intervention	Before intervention	1 st day of intervention	Last day of intervention	
Number of crying	6.12 (1.76)	8.34 (1.49)	4.26 (1.40)	6.69 (2.9)	7.50 (1.83)	6.94 (2.14)	<0.001
Length of crying (h)	4.97 (1.37)	4.12 (2.08)	1.32 (0.73)	3 (1.30)	2.42 (1.71)	2.14 (1.23)	<0.001
Length of sleeping (h)	9.22 (1.76)	10.22 (2.92)	13.12 (1.90)	12.24 (2.98)	12.38 (1.74)	12.40 (1.55)	<0.001
Score of cry severity	6.60 (1.54)	5.13 (1.63)	2.71 (0.92)	5.98 (2.22)	4.7 (1.51)	4.03 (1.14)	<0.001
Repeated measurement-test results	P<0.001 - Interaction between time and group			P<0.001 - Interaction between time and group			

SD: Standard deviation

Table 3: Tukey honest significant difference pairwise comparisons for variable time

Colic symptoms	Times	Massage (n=50)				HSD statistics	Rocking (n=50)			
		Time means		Mean difference	Time means		Mean difference	HSD Statistics		
		First time	Second time		First time				Second time	
Number of crying	0 versus 1	6.12	8.34	2.22	7.91*	6.96	7.50	0.54	1.92	
	0 versus 7	6.12	4.26	1.86	6.63*	6.96	6.94	0.02	0.07	
	1 versus 7	8.34	4.26	4.08	14.54*	7.50	6.94	0.56	2.00	
Length of crying (h)	0 versus 1	4.96	4.12	0.84	4.04*	3.00	2.42	0.58	2.80	
	0 versus 7	4.96	1.33	3.64	17.53*	3.00	2.15	0.86	4.12*	
	1 versus 7	4.12	1.33	2.80	13.49*	2.42	2.15	0.28	1.33	
Length of sleeping (h)	0 versus 1	9.22	10.22	1.00	3.18	12.24	12.38	0.14	0.44	
	0 versus 7	9.22	13.12	3.90	12.42*	12.24	12.40	0.16	0.51	
	1 versus 7	10.22	13.12	2.90	9.23*	12.38	12.40	0.02	0.06	
Score of cry severity	0 versus 1	2.32	5.13	2.81	17.69*	2.12	4.70	2.58	16.26*	
	0 versus 7	2.32	2.71	0.39	2.48	2.12	4.11	1.99	12.52*	
	1 versus 7	5.13	2.71	2.41	15.21*	4.70	4.11	0.59	3.74*	

Studentized range critical value (0.05, 3, 294)=3.33, *Significant at 0.05 level. HSD: Honest significant difference

be as effective as chiropractic spinal manipulation.^[23] In the study of Arikan *et al.* the average number of crying occurrence reduced from 5.34 to 4.37 hours in a day in the massage group after the intervention, however, the reduction was higher in other methods of treatments such as herbal tea and application of formula relative to massage. The study suggested that the massage had been compared with oral methods in alleviating the symptoms of colic, and these methods probably had faster impact than massage in this respect; however, massage may have more effects in the long run, and it has less side effects than oral treatments.^[9] A study conducted by Huhtala *et al.* showed that the average length of infants crying during 4 weeks of intervention reduced significantly in the massage and rocking groups. The reduction in the 3rd week of intervention, was 64% in the massage group and 52% in the rocking group. The results of the study showed that, in both the intervention groups (massage and rocking), there was a significant statistical reduction in the time of crying; in addition, based on the findings of the current study, the reduction is higher in the massage group than that of the rocking group.^[10] The difference may be rooted in difference between the sources of the movement. In the

study of Huhtala *et al.*, a standard vibrator in which the rate and intensity of vibration were completely adjusted, was used to rock the infants, however, in the current study mothers were supposed to embrace the infants and rock them gently for 20 minutes; therefore, controlling the intensity of the movements was not possible.

The comparison of the colicky infants before the intervention and on the first and the last days of the intervention in both the groups indicated a significant decrease in the severity of colic crying, however, this difference was much greater in the massage group. The examination of the crying intensity is not recorded in similar studies and it is reported in this study for the first time.

In the present study, the length of sleep on the first and the last days of intervention were investigated and the findings revealed a significant difference on the first and last days of both the interventions. This difference was much greater in the massage group. In Roobahani *et al.* study, the length of sleep in infants after massage was 16.24 hours per day, and there was a significant increase in comparison with before the intervention.^[13] Alvandi *et al.* noted a significant

difference in the mean length of sleep 24 hours before and 90 minutes after therapeutic manipulation daily.^[22] The findings of the present study are compatible with the previous studies in terms of the increase in the mean length of sleep, however, the increase in the present study in the massage group was greater than that in the study by Alvandi, which can be due to the effect of using massage therapy instead of therapeutic manipulation.

There were some limitations in the study, including possibility of making an error in data registering because they were registered at home by the mothers and it was impossible to control the errors. On the other hands, it was impossible to use a control group without any treatment because it is immoral to take no medical action when the infant is suffering from pain.

Conclusion

According to the findings of the current study, massage seems to be more effective than rocking in relieving the symptoms of infantile colic. Considering that massage is a complementary treatment without any side effect for infants and its ability to increase the contact between a mother and her child, it can be recommended for alleviating the infantile colic symptoms.

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Conflicts of interest

There are no conflicts of interest.

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