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RESEARCH PAPER

The effectiveness of aromatherapy massage using lavender oil as a treatment for infantile colic

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The effectiveness of aromatherapy massage using lavender oil as a treatment for infantile colic

The aim of this paper was to investigate the effect of aromatherapy massage using lavender oil as a possible treatment for this condition. This research was carried out on a group of 40 infants between 2 and 6 weeks of age with a gestational age of 38–42 weeks and normal development and growth. All the infants weighed between 2500 and 4000 g at birth and all exhibited the signs of colic.

Infants in the treatment group received abdominal massage by their mothers using lavender oil, while those in the control group were not subject to an intervention. The infants in both control and treatment groups were monitored once a week by the researchers, in total five times. The effect of the massage was measured in terms of changes in the length of time the infants cried per week. The use of aromatherapy massage using lavender oil was found to be effective in reducing the symptoms of colic.

Key words: aromatherapy massage, infantile colic, nursing.

INTRODUCTION

Infantile colic is a syndrome seen in otherwise healthy infants which is characterized by paroxysms of uncontrollable crying—often in the evening—accompanied by drawing the legs into the abdomen, clenching of fists and passing gas and which is difficult to stop by any means.[1]

Excessive crying in infants is defined in Wessel *et al*.[2] as crying that starts in the first weeks of life, generally in the infant's first 3 months, and which continues for more than 3 h a day for at least 3 days a week, lasting at least 3 weeks; it usually occurs in the afternoon and evening for no apparent reason and is uncontrollable.[2]

Paroxysms of colic generally start in the second week and reach their height in the sixth week. The unexplained crying episodes can continue 4–6 months of age.[3] The causes of infantile colic are still largely unknown, but appear to be multifactorial.[4] Possible factors include cow's milk/soy protein allergy/intolerance, problems in the gastrointestinal system, parent–child relationship difficulties and immaturity of the central nervous system.[4–6]

Infantile colic can, moreover, lead to needless hospitalizations, problems in the parent–infant relationship, marital difficulties and mistreatment of the infant.[7]

Canivet *et al*. studied 4-year-old children who had suffered from colic as infants and found that they were more likely to have negative personalities, to experience

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nutritional problems and to be diagnosed with stomach pain.[8] There are some effective therapies for infant colic, but additional rigorous studies of existing and alternative therapies are needed.[9]

Colic can be effectively treated by teaching parents more effective responses to their infant's crying.[10]

Massage is widely used as a treatment for colic in Europe. Studies found abdominal massage to be effective in reducing the symptoms of colic.[11,12]

Some of the studies which have investigated massage as a treatment have used essential oils.[13–15] Although essentials oils can be used in many ways, massage is the most important and commonly used method of applying them in aromatherapy. This is because massage combines the therapeutic power of touch with the properties of the oils.[16]

Lavender oil has sedative, antispasmodic and anticolic properties.[17,18] As a result of these properties, it is thought that this oil might be able to relieve the symptoms of colic.[17,19]

Two means of administering lavender oil are recommended—topically and by inhalation.[17,20] In paediatrics, to be able to use essential oils safely, it is important to know about their toxic effects, as well as to know which are the most appropriate ways of applying them including frequency of application for infants and children. To avoid unwanted results from aromatherapy massage, it is thus recommended that essential oils be diluted.[18,21] Essential oils are generally diluted in vegetable oils, cream, gel or water.[17,18]

For newborn infants up to the age of 6 months, the recommended dilution is 1 drop of essential oil in 20 mL of solution.[17]

Although several essential oils are recommended for aromatherapy massage for infants, this study investigated the effect of using lavender oil in aromatherapy massage as a treatment for infantile colic.

THE STUDY

Aim

The aim of the study was to investigate the effect of aromatherapy massage using lavender oil on infantile colic.

Design

This study was a quasi-experimental trial with randomized research with a control group not given the intervention in a 'time series' model.[22,23]

Participants

The research was conducted in the Denizli region in the west of Turkey. The research population comprised mothers and infants from high, medium and low socioeconomic groups living in the areas covered by three clinics linked to the Denizli province Health Department. The infants were between 2 and 6 weeks of age with a gestational age of 38–42 weeks and normal development and growth; they weighed between 2500 and 4000 g at birth and all exhibited the signs of colic, that is crying at least 3 h a day and for more than 3 days a week.

With the aim of defining the research population, the 21 public health clinics linked to the Denizli Province Health Ministry were divided according to socioeconomic level into three groups: high, medium and low. One public health clinic from each socioeconomic group was chosen using a simple random sampling method.[23]

The 40 infants who participated in the study—20 in the control group and 20 in the treatment group—were chosen from infants suffering from colic who were registered with these clinics. A comparison of the age, birth order, weight, number of hours of crying per week, nourishment situation and sex was carried out between the two groups. The sample group was chosen using randomization.[23]

Before the experimental procedure was started, the diagnosis of colic for infants in the treatment group was confirmed following examination by paediatricians, abdominal ultrasound and inspection of urine and faecal matter. Infants in the control group were also examined by doctors at the health clinics they were registered to and were also confirmed to have colic.

Once it had been determined that the infants had colic, it was possible to access information regarding the infants and their mothers from the health clinic records. Ninety-two mothers of infants who met the research criteria were interviewed by telephone. They were asked whether their children cried more than 3 days a week for at least 3 h a day. The 51 mothers who affirmed that this was the case were interviewed at home and asked to record their infant's crying over a period of 7 days. At the end of this period and after analyzing the data, it was found that 42 of the infants cried 3 days a week for at least 3 h a day.

Data collection

Apart from a preliminary observation, a total of five observations were carried out to monitor the infants who were participating in the research, with 1 week separated

each observation; Wessel criteria were used during the evaluations. The mothers of the infants recorded any crying that lasted for more than 15 min for the period of 1 week; the researchers monitored the babies on their weekly house visits.

Intervention

After taking data in a preliminary observation, the mothers in the treatment group received aromatherapy massage training at home. They were told to use a solution of 1 drop of lavender oil mixed in 20 mL of almond oil, to start the massage within 1–2 min of the onset of the colic attack and shown how to perform the abdominal massage, which was to last between 5 and 15 min. The solution was prepared by the researchers using a standard dropper to add one drop of lavender oil to 20 cc almond oil bottles; it was given to families with needleless injectors so that they could measure out 1 cc easily. Use of the solution was limited to 1 cc per day. The abdominal massage was first demonstrated by the researchers on a dummy infant, after which the mothers were able to develop their massage technique through practice on the dummy. The mothers were also given a booklet prepared by the researchers containing all the information provided during the training. Although the control group infants did not receive any intervention, to avoid their potential withdrawal from the study they were provided with both the massage training and the booklets after the research was completed.

Data analysis

The data analysis was carried out using the Statistical Package for Social Sciences (SPSS) for Windows 10.0 statistical program (SPSS, Chicago, IL, USA). The data analysis involved calculating percentage distributions of the symptoms shown by the treatment and control groups of infants with colic as well as a homogeneity test (χ^2) and independent *t*-test. Repeated measures analysis of variance was performed to evaluate the differences in terms of average crying times between observations.

Since the result of the Mauchly test was statistically significant ($P < 0.05$), Wilks' Lambda values were used.

To compare the mean weekly crying times for the treatment and control group infants both before the massage started using the data gathered in the preliminary observation and after it started using the later observation figures, the paired sample *t*-tests with Bonferroni adjustment.

The resulting test significance (*P*) value was compared with the corrected significance level. The corrected significance level (significance level/number of groups) obtained for $\alpha = 0.05$ was calculated to be $0.05/4 = 0.0125$. Since significance levels of smaller than 0.01 reduce the power of the test, a significance level of 0.01 was adopted.[24–26]

Ethical considerations

The study protocol was approved by the ethical committee of the School of Nursing. After receiving permission from the ethics committee, written permission was obtained from the Denizli Province Health Ministry.

After giving the necessary information to families who had agreed to participate in the research, written permission was obtained from families in the treatment group and verbal permission from the control group families.

RESULTS

A total of 40 infants completed the study. The treatment and control groups were created by a randomization process taking into account the age, birth order, weight, weekly crying time, whether they were breastfed or not, and sex of the infant. The characteristics of infants are described in Table 1.

Comparison of the treatment group infants with infants in the control group, who did not undergo aromatherapy massage, indicated a statistically significant difference between the groups in terms of weekly crying time by observation (Wilks' Lambda $\Lambda = 0.22$, $P < 0.05$). It was found that the mean weekly crying time for infants in the treatment group started decreasing from the first observation. In contrast, observations of infants in the control group did not show a change in mean weekly crying time (Table 2).

After comparison of the mean weekly crying times measured for the treatment and control groups in the preliminary observation carried out before the aromatherapy massage with the weekly crying time measurements taken in observations after the start of the massages, there were found to be statistically significant differences between all measurements taken for the treatment group ($P < 0.01$). However, no significant difference was found between the measurements taken for the control group ($P > 0.01$) (Table 3).

DISCUSSION

Aromatherapy is a complementary therapy and is accepted as one of the tools of holistic nursing.[27]

Table 1 Characteristics of colicky infants

Criteria	Treatment group $n = 20$	Control group $n = 20$	Statistical significance
Age (days)	27.70 ± 7.96	23.75 ± 6.56	$t = 1.71$ $P > 0.05$
Gender			
Male *n* (%)	10 (50%)	7 (35%)	$\chi^2 = 0.92$ $P > 0.05$
Female *n* (%)	10 (50%)	13 (65%)	
Birthweight (g)	3065.5 ± 244.33	3186.5 ± 366.69	$t = -1.23$ $P > 0.05$
Total crying time per week before the start of aromatherapy massage treatment (hours/week)	13.28 ± 2.84	13.35 ± 2.53	$t = -0.08$ $P > 0.05$
Birth order			
First child *n* (%)	8 (40%)	9 (45%)	$\chi^2 = 0.10$ $P > 0.05$
Second child *n* (%)	12 (60%)	11 (55%)	
Type of feeding			
Breastfeeding *n* (%)	18 (90%)	17 (85%)	Fisher $P > 0.05$
Breastfeeding and formula feeding *n* (%)	2 (10%)	3 (15%)	

Table 2 Mean crying times for the treatment and control groups by observation (hours/week)

Observation	Treatment group $n = 20$		Control group $n = 20$	
	$\bar{X}$	SD	$\bar{X}$	SD
Preliminary observation	13.28 ± 2.84		13.35 ± 2.53	
Observation 1	11.27± 2.92		13.25 ± 2.55	
Observation 2	9.54 ± 2.59		13.21 ± 2.66	
Observation 3	7.56 ± 2.14		13.14 ± 2.59	
Final observation	6.27 ± 2.16		13.37 ± 2.53	

Wilks' Lambda $\Lambda = 0.22$, $P < 0.05$.

SD, standard deviation.

Table 3 Mean weekly crying times between observations for treatment and control groups

Weekly crying time	Treatment group		Control group	
	t	*P*	*t*	*P*
Preliminary observation—Observation 1	8.09	< 0.01	2.42	> 0.01
Preliminary observation—Observation 2	8.89	< 0.01	1.38	> 0.01
Preliminary observation—Observation 3	10.73	< 0.01	1.78	> 0.01
Preliminary observation—Final observation	12.62	< 0.01	−0.05	> 0.01

Massage and aromatherapy massage are considered to decrease anxiety and aid with muscle relaxation and pain relief.[28] The combination of massage and aromatherapy massage using aromatherapy oil has been found to greatly enhance and prolong the health-giving effects mentioned previously.[29]

Common herbs such as *Matricariae recutita*, *Foeniculum vulgare* and *Melissa officinalis* have an antispasmodic and antimeteoric activity.[30]

In Alexandrovich *et al.*'s[31] randomized placebo-controlled trial to investigate the effectiveness of fennel oil as a treatment for infantile colic, the treatment group

was orally administered fennel oil. The treatment and control groups were observed for a period of 7 days and it was found that the severity of the colic of infants in the treatment group was reduced. This research found that fennel oil is effective as a treatment for infantile colic.[31]

Savino *et al*.[32] carried out a study in which a mixture of German camomile, fennel and lemon balm oil were administered orally to treat infantile colic and infants were observed for 7 days after a preliminary examination to gather data. This study also found the treatment to be effective.[32]

Other studies have found German camomile, fennel and lemon balm oil to have an antispasmodic effect.[17] Our study also drew on the antispasmodic effect of lavender oil.

For infants and children touch is physical evidence that they are loved. It also promotes parent–child interaction and healthy relations, leading to positive effects on the infant's development throughout their life. The first communication that parents can create with their child is by means of touch, and massage is one of the most suitable ways of touching an infant.[33]

Furthermore, massage also causes the dilation of blood vessels in the dermis, allowing them to absorb essential oils and assist blood circulation.[17]

In Huhtala *et al*.'s[12] study, those looking after the infants performed abdominal massage on colicky infants for 15 min during colic paroxysms. The treatment continued for 3 weeks after the initial data were collected. Weekly observations provided evidence that the infants' crying times decreased.[12]

Jan-Helge Larsen[11] proposed that belly massage is best carried out 15–30 min after a meal, in continuation of the gastrocolic reflex. During massage the smooth muscle of the intestine is relaxed because of the cutovisceral reflex and eventually flatus and faeces are passed. This study also found abdominal massage to be an effective treatment for infants with colic.[11]

CONCLUSION

This study united the twin benefits of massage and aromatherapy to provide more effective treatment through the complementary approach of aromatherapy massage.

Study data indicate that the aromatherapy massage with *Lavandula angustifolia* oil could be effective for the reduction of infantile colic. It indicates that this form of treatment should be taken seriously as an effective treatment.

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