

Original Article

Factors Affecting Colic in Infants and the Applications of Mothers in Turkey

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Abstract

Objective: This descriptive cross-sectional study was conducted to determine the factors affecting gas pains in infants aged 0–4 months and applications of mothers in this area.

Methods: The data of the study were collected by the questionnaire (37 questions) generated by the researchers as a result of the literature review. Data were evaluated and tabulated using average, standard deviation, percent, Fisher's exact test, and the chi-squared test in the SPSS (22.0) package program. Statistical significance was accepted to be $p < 0.05$.

Results: The results of this study indicate that in order to alleviate or halt the colic in their babies, mothers often used behavioral therapy (massage, patting on the back, cradling or swinging baby by arms, etc.) followed by drug therapy and natural therapy, respectively. Some sociodemographic characteristics (educational status, age, place of residence, stressful personality) affected the applications for colic.

Conclusion: Mothers of babies can be informed and stress can be reduced in parents in hospitals or at home visits regarding the physiology of infantile colic, its effects on infants and the methods used in relieving gas pains by nurses and midwives.

Key words: Application, infant, infantile colic, midwife, mother, nurse.

Introduction

Infantile colic (gas pain) is a syndrome seen in healthy infants between 2 weeks and 4 months of age, mostly in the evenings, carrying paroxysmal features, seen alongside pulling on the legs, squeezing the fists, gas relieving, difficulty stopping despite all of the struggles and characterised by excessive

crying (Yakut & Tunc, 2007; Ciftci & Arikan, 2007).

According to Wessell, infantile colic is a condition which causes uneasiness, agitation and excessive crying in healthy 0-3 month-old infants with normal development, lasting for more than 3 hours per day, for at least 3 days per week, for more than 3 weeks (Akcaml, 2004; Alagoz, 2013; Savino et al.,

2014). Although the aetiology of the infantile colic seen in approximately 40% of all infants is not fully known, gastrointestinal system problems, impaired parent-infant communication, and central nervous system immaturity are among the factors that can cause infantile colic (Akcem, 2004; Yakut & Tunc, 2007; Karabel et al., 2010; Cetinkaya & Basbakkal, 2011; Hall et al., 2012; Alagoz, 2013).

Treatment is also debatable, as it is not clear whether colic is a disease or a normal behaviour. However, because this condition harms the family-infant relationship, various treatment models (drug, behavioural and natural therapy) are applied to eliminate or alleviate the symptoms (Yakut & Tunc, 2007; Karabel et al., 2010). Simethicone in drug therapy (Yakut & Tunc, 2007; Karabel et al., 2010), herbal treatments such as fennel tea, zinc, nurse-Harvey's vegetable oil, and apple oil in natural therapy (Karabel et al., 2010), and holding the baby on the lap more, swinging them, early responses to crying, avoiding excessive stimulus, mild sedative movements, pacifiers, the kangaroo method and vacuum cleaner noise in behavioural therapy are all stated to be effective (Roberts et al., 2004; Yakut & Tunc, 2007; Karabayir & Oguz, 2009; Karabel et al., 2010). In a previous study, it was determined that 100% of mothers used behavioural therapy, 66% used drug therapy and 64.5% used natural therapy methods for the treatment of colic (Ciftci & Arikan, 2007). In one study, massage, sucrose solution, herbal tea and hydrolysed formula products (Arikan et al., 2008), and in another study, aromatherapy massage done with lavender oil, were found to be effective in colicky babies (Cetinkaya & Basbakkal, 2011).

Infantile colic can cause stress and strain in the family by affecting the parent-infant relationship. It is important for nurses and midwives to inform and relieve stressed parents in the hospital or at home visits about the physiology of infantile colic, its effects on infants and the methods to be used in relieving gas pains (Keefe et al., 2006; Ciftci

& Arikan, 2007; Karabayir & Oguz, 2009; Karabel et al., 2010). For this reason, this study was conducted to determine the factors affecting colic in infants aged 0-4 months and the applications of mothers in this area.

Methods

Design of the study

This study was conducted as descriptive cross-sectional.

Settings of the study

The application of the research was carried out in the central Family Health Centres in Sivas (Alibaba, Aydoğan, Çarşıbaşı, Çayyurt etc.) in Turkey.

The population and sample of the study

Mothers who applied to Family Health Centres (22 centres) in Sivas between 15.02.2015 and 15.05.2015 created the population of this study. The sample of this study consisted of voluntary mothers who applied to Family Health Centres in Sivas (Alibaba, Aydoğan, etc.) between 15.02.2015 and 15.05.2015 and whose babies had colic between 0 and 4 months of age who are now older than 4 months.

Collection of the data

The data of the study were collected by the questionnaire generated by the researchers as a result of the literature review. The questionnaire included 37 questions about socio-demographic characteristics such as age, number of pregnancies, education level, factors affecting the colic, and the applications of mothers towards colic.

Application of data collection tools

Before the study, ethical approval from the Cumhuriyet University Non-Interventional Clinical Trials Ethics Committee (2015-01/16) was obtained. After verbal and written approvals (using informed consent form) were obtained from mothers who agreed to participate in the study, data were collected using the face to face interview method with a questionnaire applied by the researchers. It was explained that it was not obligatory to specify their name on any data

collection form except for the consent form and that all information would remain confidential. Participants who gave written consent for voluntary participation in the study were given forms to be used in the research and were asked to complete them. If illiterate mothers took part in the study, the questionnaire was read to the mothers and marked by the researcher.

Evaluation of the data

Data were evaluated using number and percentage distribution, chi square, and Fisher's exact test in the SPSS (22.0) package program. Statistical significance was accepted as $p < 0.05$.

Results

Overall, 54.4% of mothers were in the 21–30 age group, 33.8% were secondary school graduates, 88.7% had social security and 41.3% had a stressed personality. Also, 79.1% of women were not working, 48% were living in the city, and 69.2% were living with their spouses and children. In addition, 64.6% of mothers in the study had undergone a caesarean section, 35.4% had a normal birth, 70% had a planned pregnancy, 31.1% had 2 pregnancies and 40.5% had 2 children alive. Finally, 55.2% of babies were 5–12 months old, 50.9% were girls, 46.6% had a birth weight between 2001 and 3000 gr, 50.1% were now 5001 gr and overweight, 40.48% were the second child of the family, and 89% of mothers took care of their babies themselves.

When breastfeeding characteristics of mothers in the first 4 months were examined, it was found that 96.8% of mothers breastfed their babies, 70.8% fed them with breast milk, 56% breastfed in the first half hour, 52.3% gave breast milk for the first 5 months or more, 56.3% gave supplementary food, 84.3% gave supplementary food with spoon, 15.7% used bottle and 51.5% of them held

the bottle vertically. Also, 53.1% of mothers used a dummy, 12.6% gave a dummy after sweetening, 72.4% consumed gas-making foods, 76.1% consumed harmful foods, with tea (45.0%) and cigarettes (54.3%) consumed mostly as harmful substances, 94.4% had held their babies on their lap after birth, and 55% of those held their babies on their lap in the first half hour (Table 1).

Overall, 41% of mothers who realised their babies had colic applied drug therapy in the first 4 months, with 70.6% of the drugs consisting of zinc; also, 25.7% of mothers gave herbal tea with 84.4% of the tea containing fennel. In total, 58.2% of mothers held their babies on their lap, 13.1% used the noise of a blow dryer, 23.6% made them listen to washing machines or vacuum cleaner noise, 28.4% drove them around in the car, 74% applied massage and patted them on the back, 37% used hot applications, 39.9% changed their positions frequently, 17.1% made them listen to light music and 11.8% gave them a bath for colic (Table 2). Mothers stated that babies were most comfortable with patting them on the back and massaging (70.2%).

Secondary school graduate mothers mostly applied drug therapy and blow dryers, mothers in the 21–30 age group mostly held their babies on their laps and made them listen to washing machine noise, mothers living in the county mostly gave herbal tea, while villagers and city dwellers gave them baths, and mothers who stated that they do not have a stressed personality mostly held their babies on their lap and gave them massages; the difference between them was statistically significant ($p < 0.05$) (Table 3). In addition, it was determined that fennel tea was mostly given to the second child, and was mostly used in babies fed by a spoon; the difference between them was statistically significant ($p < 0.05$).

Table 1. Some Characteristics related to Mothers' Breastfeeding in the first 4 Months

Breastfeeding characteristics of babies (n: 373)			
	n(%)		n(%)
Breastfeeding		Eating gas making foods	
Breastfed	361(96.8)	Eaten	270(72.4)
Not breastfed	12(3.2)	Not eaten	103(27.6)
Nutrition type		Consumption of harmful foods	
Breast milk	264(70.8)	Consumed	284(76.1)
Formula	12(3.2)	Not consumed	89(23.9)
Breast milk and formula	97(26.0)		
First breastfeeding time after birth		Daily consumption of harmful substances	
Within the first half hour	209(56.0)	Smoking: 5 and less pieces	158(25.2)
Within the first hour	91(24.4)	Smoking: between 6 and 10 pieces	126(29.1)
Within the first 2 hours	28(7.5)	Tea: 5 cups and less	194(30.9)
After 1 day	18 (4.8)	Tea: between 6 and 10 cups	88(14.1)
After 2 days	21(5.6)	Coffee: 5 cups and less	61(9.7)
After 3 days	6(1.7)		
Breastfeeding duration		Giving supplementary food	
First 4 months	178(47.7)	Given	210(56.3)
5 months and over	195(52.3)	Not given	163(43.7)
Dummy use		Type of giving supplementary food (n:210)	
Used	198(53.1)	With spoon	177(84.3)
Not Used	175(46.9)	With bottle	33(15.7)
Type of dummy use (n:198)		Type of bottle holding (n:33)	
After sweetening	25(12.6)	Horizontal	16(48.5)
Without sweetening/normal	173(87.4)	Vertical	17(51.5)
Holding baby on lap after birth		Time of holding baby on after birth	
Held	352(94.4)	First half hour	205(55.0)
Not held	21(5.6)	After the first half hour	168(45.0)

Table 2. Distribution of Mothers' Applications for Colic in the first 4 Months

Applications for colic (n: 373)	
	n(%)
Realizing the colic	
Cry episodes, abdominal distention	305(81.8)
Pulling legs up	68(18.2)
Drug therapy for colic	
I applied	153(41.0)
I did not apply	220(59.0)
Type of drug (n:153)	
Zinco	108(70.6)
Simethicone (Methicillin)	27(17.6)
Nursehavey	7(4.6)
Biogoia	6(4.0)
Sapsimplex	5(3.2)
Holding baby on for colic	
I did	217(58.2)
I did not	156(41.8)
Hot application for colic	
I did	138(37.0)
I did not	235(63.0)
Massaging, patting on the back for colic	
I did	276(74.0)
I did not	97 (26.0)
Frequent change of position for colic	
I did	149(39.9)
I did not	224(60.1)
Bathing for colic	
I did	44(11.8)
I did not	329(88.2)
Giving herbal tea for colic	
I gave	96(25.7)
I did not give	277(74.3)
Type of herbal tea (n:96)	
Fennel	81(84.4)
Cummin	8(8.3)
Anasone	4(4.2)
Mulberry	3(3.1)
Blow drier application for colic	
I applied	49(13.1)
I did not apply	324(86.9)
Driving around for colic	
I did	106(28.4)
I did not	267(71.6)
Listening to washing machine or vacuum cleaner voice for colic	
I did	88(23.6)
I did not	285(76.4)
Listening to light music for colic	
I did	64(17.1)
I did not	309(82.9)

Table 3. Distribution of some Socio-Demographic Characteristics of Mothers according to their Colic Applications in their Infants

Education status	Drug therapy for colic		Blow drier for colic	
	Applying n(%)	Not applying n(%)	Applying n(%)	Not applying n(%)
Illiterate	0(0)	1(100)	0(0)	1(100)
Literate	2(33.3)	4(66.7)	1(16.7)	5(83.3)
Primary school	16(23.5)	52(76.5)	3(4.4)	65(95.6)
Secondary school	61(48.4)	65(51.6)	20(15.9)	106(84.1)
High school	47(44.8)	58(55.2)	10(9.5)	95(90.5)
University	27(40.3)	40(59.7)	15(22.4)	52(77.6)
Total	153(41.0)	220(59.0)	49(13.1)	324(86.9)
X²/p	12.909 / 0.024*		11.806 / 0.038*	
Age group	Holding on a lap for colic		Washing machine voice for colic	
	Holding	Not holding	Listening	Not listening
≤20 ages	15(68.2)	7(31.8)	5(22.7)	17(77.3)
Between 21-30 ages	117(57.6)	86(42.4)	63(31.0)	140(69.0)
Between 31-40 ages	84(60.9)	54(39.1)	19(13.8)	119(86.2)
≥41 ages	1(10.0)	9(90.0)	1(10.0)	9(90.0)
Total	217(58.2)	156(41.8)	88(23.6)	285(76.4)
X²/p	10.880 / 0.012*		14.660 / 0.002*	
Residence place	Herbal tea for colic		Bath for colic	
	Giving	Not giving	Bathing	Not bathing
Village	8(14.0)	49(86.0)	14(24.6)	43(75.4)
County	48(35.0)	89(65.0)	8(5.8)	129(94.2)
City	40(22.3)	139(77.7)	22(12.3)	157(87.7)
Total	96(25.7)	277(74.3)	44(11.8)	329(88.2)
X²/p	11.359 / 0.003*		13.641/0.001*	
Stressed personality	Holding on a lap for colic		Massaging for colic	
	Holding	Not holding	Doing	Not doing
Yes	99(64.3)	55(35.7)	128(83.1)	26(16.9)
No	118(53.9)	101(46.1)	148(67.6)	71(32.4)
Total	217(58.2)	156(41.8)	276(74.0)	97(26.0)
X²/p	4.023 / 0.045*		11.343 / 0.001*	

*Difference of distribution is statistically significant; chi square test, exact test; $\alpha:0,05$

Discussion

It is known that feeding only with breast milk for the first six months is a protective factor in infantile colic (Zengin et al., 2016). In the study, it was determined that the mothers mostly breastfed their babies (96.8%), with 52.3% of them giving breast milk for the first 5 months or over. In a previous study, it was shown that breast milk includes melatonin during the night, meaning that nights are good for breastfeeding infants to reduce colic (Engler et al., 2012). In the study by Alagoz and Ertekin (2013), 96.8% of the infants were found to receive breast milk with 2.5% of them only having received formula. In addition, Yalcin and Kuskonmaz (2011) found that mothers of babies with colic had low breastfeeding average scores and breastfeeding techniques which were wrong.

Although the data on the relationship between nutrition type and colic development were controversial, no significant relationship was found between colic incidence and nutrition type in a number of studies (Talachian et al., 2008; Karabel et al., 2010). It was determined that more than half of the mothers (56.3%) gave supplementary food. The time and content of supplementary food given to infants is important. Soy-based products for infants with cow's milk allergies and whey or casein protein hydrolysed formula have been reported to be useful in infantile colic (Yilmaz et al., 1999; Karabayir & Oguz, 2009; Iacovou et al., 2012; Alagoz & Ertekin, 2013; Savino et al., 2014). It has been shown recently that since some probiotics regulate the intestinal flora, they can be used from the newborn period and probiotics containing *Lactobacillus reuteri* have been shown to be effective in treating colic crying (Alagoz, 2013; Savino et al., 2014; Harb et al., 2016).

Feeding with a bottle in a horizontal position and not removing the baby's gas after feeding causes the formation of infantile colic (Karabayir & Oguz, 2009; Zengin et al., 2016). In our study, it was determined that

15.7% of the mothers used bottles and nearly half of them (48.5%) held the bottles horizontally. In Ciftci and Arikan's (2007) study, 26.6% of mothers were found to use bottles, and about 40% of them held the bottles vertically. In our study, dummy use was reported in 53.1% of babies and 12.6% received dummies after sweetening, while in another study, dummy use was at a level of 37.6% and 41.4% used dummies after sweetening (Ciftci & Arikan, 2007).

The maternal diet content in infants receiving breast milk and the use of tea, cigarettes and alcohol by the mother increased the risk of colic in infants (Hill et al., 2005; Alagoz, 2013; Zengin et al., 2016; Harb et al., 2016). When the nutritional characteristics of mothers in our study were evaluated, 72.4% were found to consume gas-making foods, and 76.1% of them consumed harmful foods, with many found to consume tea (45.0%) and cigarettes (54.3%) as harmful substances. It was found that mothers' avoidance of gas-making foods did not significantly affect the colic (Ciftci & Arikan, 2007; Alagoz & Ertekin, 2013), but cigarette use caused infantile colic (Reijneveld et al., 2000; Alagoz & Ertekin, 2013).

Because of its effects on the infant and the family-infant relationship, it is important to remove or alleviate infantile colic which is a common problem in the first year of infancy (Yalaz, 2003; Lobo et al., 2004). In our study, 41% of mothers who identified their baby's colic used drug therapy in the first 4 months, with 70.6% of drugs containing zinc and 17.6% containing simethicon (metsil). It was determined that mothers applied drug therapy (zinc, metsil, etc.) for colic (Ozyazicioglu, 2004; Ciftci & Arikan, 2007; Karabel et al., 2010). Hall, Chesters & Robinson (2012) stated that pharmacological interventions in infantile colic are not effective or appropriate.

Although there have been various studies on the effect of herbal teas in colic treatment, fennel, liquorice and chamomile are the most commonly used herbs in colic treatment

(Yakut & Tunc, 2007; Karabayir & Oguz, 2009; Savino et al., 2014). It has been shown in several studies that some herbal teas, especially fennel, are particularly effective in eliminating colic (Ciftci & Arikan, 2007; Karabel, 2009). In our study, it was determined that 25.7% of the mothers used herbal tea, and that 84.4% of this herbal tea was fennel. In a previous study, it was determined that 15.1% of the mothers used fennel for colic (Ciftci & Arikan, 2007).

Various applications (massage etc.) strengthen the mother-infant communication and reduce colic by relieving the baby and making them sleep (Alagoz, 2013). In our study, mothers used massaging (74%), holding on the lap (58.2%), frequent changes of position (39.9%), making hot applications (37%), driving the baby around (28.4%), listening to the noise of the washing machine or vacuum cleaner (23.6%), listening to light music (17.1%), the application of a blow dryer (13.1%) and bathing (11.8%) to alleviate or cure colic. Similar to our study, it was also found that mothers mostly used behavioural therapy (massaging, patting on the back, holding the baby on their lap, cradling or swinging the baby by the arms, positioning, using warm applications, and making them listen to music, etc.) to alleviate or cure the colic and used drug therapy and natural therapy, respectively (Ciftci & Arikan, 2007; Alagoz & Ertekin, 2013). The mothers in our study stated that patting the baby on the back and massaging them were most efficient methods for relieving the symptoms of colic (70.2%). As in our study, it has been shown that the most effective behavioural therapy application is massage (Ciftci & Arikan, 2007; Cetinkaya & Basbakkal, 2011; Alagoz & Ertekin, 2013). These results show that mothers often use patting on the back and massaging, believing that they are most effective.

The duration of colic can change according to a number of variables, but it usually starts after two weeks and is cured before four months; however, it extends to the fifth month in 30% of cases (Karabel et al., 2010;

Alagoz, 2013; Zengin et al., 2016). A statistically significant relationship was found between the practices performed for colic according to variables such as educational status, place of residence, stressful personality and age ($p < 0.05$). It has been determined that secondary school graduate mothers are more likely to prefer drug therapy and the blow dryer methods. On the other hand, Ciftci and Arikan (2007) did not find a statistically significant relationship between the education levels of the mothers and the applications for colic. As stated in Ciftci and Arikan (2007) and Ozyazicioglu's (2004) studies, it was also found in our study that mothers in the 21–30 age group held their babies on their lap and make them listen to washing machine noises to eliminate colic. In our study, it was determined that the place where the family lived affects the applications for colic; the mothers living in the county gave herbal tea more often, while those living in villages and the city had more baths. It can be considered that the changes in the applications for the colic are related to the environment, cultural characteristics and learning resources of the family. In the literature, there has been no study investigating the relationship between colic and the place in which the family lived.

It is stated that the interaction between the mother and the baby and stress in the mother are important factors in the appearance of colic, and the stress of the parents increases when they cannot manage it (Yilmaz et al., 1999; Lobo et al., 2004; Yakut & Tunc, 2007). It was determined that 41.3% of mothers had a stressful personality and that those mothers who stated that they did not have a stressful personality held their babies on their laps, and gave them massages; the difference between them was statistically significant ($p < 0.05$). It is stated in some studies that parental behaviours and attitudes, stressful personalities and depression in the mother may be connected with infantile colic (Sondergaard et al., 2003; Akman et al., 2006; Akcam et al., 2008; Howell et al., 2009; Yalcin et al., 2010;

Abaci et al., 2013; Erdogan et al., 2014; Abbasoglu et al., 2015; Cak et al., 2015).

Limitations

This study has some limitations. Not all of the mothers who applied to the Family Health Centre were sampled. After the first 4 months, the mothers visiting the Family Health Centre often resort to the vaccination of their babies. For this reason, the questionnaires had to be given to some mothers before their babies were vaccinated.

Conclusions

All babies in the study went through colic in the period from 0-4 months and it was seen that their mothers frequently performed some behaviours such as dummy use, bottle use, eating gas-making foods. In order to alleviate or destroy the colic in their babies, mothers often used behavioural therapy (massaging, patting on the back, cradling or swinging the baby by the arms, positioning, warming, listening to music, etc.) followed by drug therapy and natural therapy. Some sociodemographic characteristics (educational status, age, place of residence, stressful personality) affected the applications for colic.

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