

Original Article

Milk with Honey Heals after Tonsillectomy; Bleeding, Pain and Wound Healing are in a Better Condition: An Experimental Study with Control Group

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Abstract

Objectives: To assess the effect of milk with honey in children undergoing tonsillectomy on bleeding, pain and wound healing.

Methods: The experimental study with control group was conducted out ear, nose and throat clinic and outpatient clinic in a public hospital. In the study, it was studied with children undergoing tonsillectomy who are 6-17 years of age (N=68). The standardized natural flower honey was applied to children in the experimental group after tonsillectomy, every day, in addition to the standard diet in clinical routine. The children were assigned randomly to the experimental and control groups according to the operation sequence. In collecting the data, a questionnaire, pain, wound healing and visual analog scales were used. The data were analyzed by percentage distributions, means, chi-square test, variance analysis, and correlation analysis. It was based on ethical principles.

Results: In the study, it was determined that not bleeding, is significantly less pain and the level of wound healing of children in the group milk with honey than children in the milk group ($p<.001$). It has been found that there is a strong negative correlation between the level of pain and wound healing of children in the milk with honey and milk groups ($p<.001$).

Conclusions: It has been determined that milk with honey was effective in preventing bleeding, reducing pain, and accelerating wound healing. Honey, which is a natural nutrient, is a safe care tool that can be applied in children undergoing tonsillectomy without diabetes and allergic to honey and oral feeding in addition to routine clinical diet.

Key Words: Children, tonsillectomy, bleeding, pain, wound

Introduction

Tonsillectomy, which in other words is having the tonsils out, is one of the most frequently practiced surgical operations across the world due to the fact that it holds several indications (Akbaş et al 2011; Zeren 2008). Either directly or indirectly these indications predominantly have adverse impacts on the development and growth of children (Zeren 2008).

Chronic obstructive tonsil hypertrophy, respiratory disorders related with sleeping, obstructive sleep apnea syndrome, upper airway resistance increase syndrome, malignancy suspect, peritonsillar abscess and hemorrhagic

tonsillitis are accurate indications of tonsillectomy. Parents also complain about their children's snoring, sleeping with their mouth open and respiratory standstill during the sleep in addition to the chronic tonsillitis symptoms they bear (Akbaş et al 2011).

The wound healing following the tonsillectomy is left for open wound healing which does not require any primary closure. During the closure procedure of the fossa that occurs after having the tonsils out by the scar and granulation tissue, the surface of the wound touches foods and oral pathogens for a good while. The nerve endings that are irritated as a result of these contacts

cause pain. Postoperative pain is seen in every case after tonsillectomy. Because of the fact that this pain has a negative impact on the intake of food and speaking, it is a symptom that should absolutely be taken under control (Yuca et al 2002).

Postoperative pain is a type of acute pain that starts with the surgical trauma and ends with tissue healing. Even though the level or the intensity of the pain shows individual differences, postoperative pain is the source of fear and anxiety. If not treated well enough, postoperative pain, especially during the childhood, is the source of the most important morbidity causes (Yuca et al 2002; Bulut and Guducu Tufekci 2013).

The most important problems that are encountered during the hospital procedures are the pain in the tonsillectomy area and the post-operative hemorrhage (Bulut and Guducu Tufekci 2013). In spite of the fact that several methods and procedures are followed in order to minimize the number of these problems, there has not been a true consensus for the solution of these problems (Bulut and Guducu Tufekci 2013; Akbay et al 2011; Zeren 2008; Yuca et al 2002). As in many other cases, non-pharmacologic supplementary practises were performed and searched. As a result of the fact that the individuals building the society showed more interest in the supplementary therapies, the persons and institutions that are not healthcare professionals worked for this requirement and need of the society (Tokem 2006; Naslikul and Eraltan 2002). In this way, it has become an obligation for the nurses who are healthcare professionals to take part in supplementary therapies (Turan et al 2010).

It has been scientifically stated that the supplementary methods whose effectively was proven need to be used by the nurses and surgeons during the treatment and care of patients as a complementary to modern treatment. 8 The usage level of the supplementary therapy are as follows: 42.1% in America, 48.2% in Australia, 49.3% in France, 70.4% in Canada as developed countries, 71% in Chile, 70% in China, 40% in Colombia and 80% in African countries as developing countries (Bal 2009; Ozcelik and Fadiloglu 2009). One study showed that 62 per cent of American people used, at least, one of the supplementary therapies (Turan et al 2010; Erin 2006).

The reason why there is no certain data about the use of supplementary treatment in Turkey is the fact that the number of the studies is very few, that most of these studies are not known well enough by the people in our country, that people do not have any confidence and that the number of the professionals practising these treatments is very low (Turan et al 2010; Kutlu et al 2009). Today, as supplementary treatment, milk is used for wound healing whereas honey is applied for reducing the pain and healing the wound following the surgical operation (Yalcin and Turkoglu 2010).

In addition to the basic nutritions, milk includes vitamins, minerals, enzymes and proteins for metabolic incidents (Jensen 1995). It was indicated that milk proteins and hydrolysates include high antioxidant activity and studies concerning antioxidants were carried out (Bayram et al 2008; Lindmark-Mannson and Akesson 2000). As a result of the studies that were carried out, it was concluded that thanks to its content, breast milk provided better epithelization than the artificial teardrops (Nakamura et al 1994; Suveren and Altinors 2010), and that breast milk constituted better reepithelization when compared to autologous serum drop which fits as the best option and which is most similar to the teardrop content for dry eye syndrome and persistent epithel defects (Suveren and Altinors 2010). Besides, it was found out that milk serum proteins accelerated the glutation synthesis and wound healing (Yalcin and Turkoglu 2010; Velioglu et al 2004; Manukyan et al 2008).

It has been stated that thanks to the antioxidants, antibacterial and antienflamatuar effects built-in its structure, honey helped wound healing and lessening the pain (Bulut and Guducu Tufekci 2013). It was determined that honey lessened the pain depending on tonsillectomy and the need for analgesia (Boroumand et al 2013). It has been found out that thanks to its built-in antioxidant, antibacterial and antiviral and antienflamatuar impact, honey reduced the toxic impact of chemotherapy and radiotherapy on oral mucosa namely the formation of mucositis and that lessened its intensity and increased the healing (Bulut and Guducu Tufekci 2013; Molan 1999; Biswal et al 2003; Namias 2003; Sonmez 2004; Mundo et al 2004; Al-Waili 2004; Simon et al 2006; Molan 2006; Lusby et al 2005; Ozmen and Alkin 2006; Motallebnejad et al 2008; Bardy et al

2008; Estevinho et al 2008; Medhi et al 2008; Simon et al 2008; Alandejani et al 2009; Rashad et al 2009; Khanal et al 2010; Molan 2011; Salwa et al 2012; Abdulrhman et al 2012; Bogdanov 2012; Song et al 2012). Bulut and Tufekci (2013), showed that oral health care that is being done with honey is very effective in decreasing the rates of mucositis formation and level, lessening the period of mucositis healing and increasing the healing rate (Bulut and Tufekci 2013).

Pain is a diagnosis of nursing, and it is the nurse who is primarily responsible for the management of the pain (Aslan 2006). Wound care and treatment, protecting the wound from the infections and wound treatment applications that will accelerate the healing of the wound all fall under the scope of nursing care. At the same time, lessening the hospitalization period, ensuring the patient restore his/her health as soon as possible and decreasing the cost also do take place among the objectives of the healthcare system and nursing treatment today (Conk et al 2013).

In literature, no results of the studies that analyze the effects of honey milk on the prevention of the hemorrhage after tonsillectomy, the reduction of pain and acceleration of wound healing were encountered. The increase in the awareness of pediatrics nurses about the prevalence of the use of alternative and supplementary medicine and the communication between the parents and healthcare professionals is necessary and significant (Muslu and Ozturk 2008).

The purpose of this study is to evaluate the impact of honey milk applied to the children who went through tonsillectomy operation on the post-operative hemorrhage, pain and wound healing.

Hypotheses of the Study

H1: If honey milk is applied to children after tonsillectomy operations, hemorrhage decreases.

H2: If honey milk is applied to children after tonsillectomy operations, pain decreases.

H3: If honey milk is applied to children after tonsillectomy operation, wound healing increases.

Method

The research was conducted as control group experimental. The study was carried out in KBB

clinic and polyclinic of a state hospital between the dates of June 2013 and September 2015. There are 23 beds in this clinic and polyclinic in addition to 7 nurses and 4 doctors as well as 3 staff members perform their duties here. There are 3 nurses, one being responsible and 2 others being clinic nurses between 08⁰⁰-16⁰⁰ shift. The nurse in charge carries out the management and organization of the clinic. There are generally two nurses in the clinic between 16⁰⁰-24⁰⁰ and between 08-16⁰⁰ shift at weekends and one nurse in the clinic between 16⁰⁰-08⁰⁰ shift. Approximately 15 tonsillectomy operations per month take place in this clinic.

The population of the study is comprised of 6-17 age group children (S=68) who went through tonsillectomy operation in KBB clinic between the dates of August-December 2013 in KBB clinic, who underwent an outpatient treatment and who were not given honey milk by their families except from the study. In the power analysis, the sample size, significance level was calculated as .05, confidence interval as .99 and sample representation power as 62 at the rate of 99%. The study was conducted with the whole population without even going for the sampling method. Any child who is suspected to be allergic to honey, who cannot be fed by oral route or who was diagnosed with diabetes was not included in the study. There is no child and his/her family who did not want to participate in the study or who was not in conformity with these criteria. The initial working group was determined by lot. It was honey milk group. The children who went through tonsillectomy operation were randomly assigned to the groups in a way to be included in honey milk group and milk group in turn.

Data Collection Tools

For the data collection of the study, a question form that determines the informative characteristics developed by using the literature, Wound Healing Scale (TIME) to evaluate the wound healing, Facial Expressions Grading Scale to evaluate the pain and Visual Analog Scale (VAS) was used.

Facial Expressions Grading Scale was developed by Donna Wong and Connie Morain Baker in 1981 (Gunes 2007; Tufekci and Erci 2007), and was revised in 1983. The scale is used to identify and evaluate pain in children between 3-18 age groups. It was indicated that the children liked this scale the most when compared

with the other pain measurement tools and that it also provided the most accurate pain measurement.

There are six facial expressions on the scale. The lowest score is “0” while the highest one is “5”. As the score received from the scale increases, the pain tolerance decreases and as the score decreases the tolerance increases. While applying the scale; the state of having no pain is expressed with a happy face while those who feel a bit pain or quite painful express themselves with a sad face: “This face ... “0” So happy cause have no pain, “1, Got a bit pain, “2” Got a bit more pain, “3” The pain is denser, “4” Got quite a lot pain, “5” Got the highest pain you could imagine. Then the child is told to pick the face that expresses his/her pain the best (Tufekci and Erci 2007; Eti-Aslan 2002).

In cases when objective measurement was not done due to some problems or reasons, VAS is used in order to change subjective data into numericals. There is a 100mm-long triangle atilt. The top of the triangle is colourless and “0” in measurement. As went down the bottom of the triangle, the colour gets darker and the one at the very bottom is, thus, the darkest colour. There is a connected indicator among the sides of the triangle. There is a 100mm of sensitive measurement at the back side of the triangle. Two end definitions of the parameter that will be evaluated on both sides of this measurement are written (No pain.....Excruciating Pain) and the patient is asked to define his/her own status on the triangle with the indicator. The back side of the scale is turned and the pain level of the patient is determined as a result of the 100mm-measurement. There is no language for the measurement and it is very easy to apply. The triangle can be used vertically or horizontally as per order. VAS has long been known by people, proved itself and has been accepted in the literature for a long time. It can be applied in all age groups starting from the 5 year-old ones and ending with adults (Tufekci and Erci 2007; Watanabe and Kayama 1989).

TIME, the stages of wound healings were determined in 1992 by the studies of Howes, Sooy and Harvey. As the score goes up, the level of healing increases (Gunes 2007).

Data Collection

The data was collected between the dates of August-December 2013. The characteristics of

the children were determined during the first interview (24 hours after the operation, in the clinic) by means of question forms with those who accepted to participate in the study after taking their consents upon giving pre-informatio to their parents in relation to the study. The children who were assigned to honey milk group and milk groups were evaluated in KBB polyclinic on 5th, 10th and 15th days following the tonsillectomy (According to the clynic routine, the children were summoned to the polyclinic on the 5th and 10th days for the examination of hemorrhage, pain and wound and then summoned on the 15th day for the study). The wound evaluation was made by examining the inside of the mouths of the children. The evaluation of hemorrhage and wound subsequent to tonsillectomy was made by a KBB professional who was working in the clinic and not know about the research groups (blinded-not knowing which child was given honey milk) while the evaluation of compliance with the diet and pain evaluation was made by a graduate clinic nurse (blinded-not knowing which child was given honey milk). The nurse constantly does this routine evaluations.

Intervention

According to the tonsillectomy operation routine; 4 hours after the operation took place, the oral intake starts with the regime I (warm water, warm milk, ice-cream, non-red fruit juice and yoghurt) followed by regime II (soup and tapioca pudding) 24 hours after the operation took place and finally at the end of the 52 nd hour the children are discharged from the hospital with the regime III (excluding solid foods).

Flower honey and pasteurized packaged cow milk was used in the study. Rutinely milk that was applied in the clinic was applied to both honey milk group and milk group. In addition to the diet given in the wake of tonsillectomy routinely applied in the clinic following the tonsillectomy, honey milk was applied to the honey milk group. Medical dressing and metabolic impact of the honey milk were utilized. The children along with their parents were informed about the application of honey milk by the researcher and the first honey milk application of the child was performed by the researcher himself/herself. The amount of the honey applied daily was calculated as 1gr per kg of the child. The amount of honey that will be applied within the scope of the study was mixed

in the milk of the child by using table spoon, dessert spoon, and tea spoon to make it convenient for the parents (1 table spoon full of honey is 30.96 gr., 1 desert spoon full of honey is 9.83 gr., 1 tea spoon full of honey is 3.70 gr.). The honey milk whose daily amount was calculated was given for four times a day, repeating in every 6 hours (12⁰⁰, 18⁰⁰, 24⁰⁰ and 06⁰⁰), with the regime III. 4 times a day, a cup of warm cow's milk was applied for milk group, with the regime III. Based on a previous study, the honey that was determined⁴ and the brand of the milk were prescribed by the physician. The parents provided the honey and the milk with their own means.

Intervention Materials

Honey is defined as a sweet, aromatic and a viscose syrup, excreted by honey bees and extracted from the plant nectars with invertase enzyme. Recently, it has taken an important place in the alternative medicine. Honey has antibacterial, antioxidative effect that accelerates epithelization and wound healing (Sonmez 2004; Molan 2006; Ozmen and Alkin 2006; Medhi et al 2008; Al-Waili 2003; Al-Waili 2004; Subrahmanyam and Ugane 2004; Ozlugedik et al 2006; Alandejani et al 2009).

Milk, the composition of milk includes, in addition to the main nutrients, vitamins, minerals, enzymes and proteins that are necessary for metabolic incidents (Yalcin and Turkoglu 2010; Etzel 2004; Fox and Flynn 1992; Farnaud and Evans 2003). The number of the studies and publications concerning the antioxidants that the milk includes is increasing day by day. It was indicated that milk proteins and hydrolysates contain high-level antioxidant activity (Yalcin and Turkoglu 2010; Bayram et al 2008; Lindmark-Mannson and Akesson 2000; Pihlanto 2006).

Data Analysis

The data was analyzed by the use of a computer. Correlation analysis was applied to the pain levels and wound healing of the children in both groups

- Percentage distribution and average; in the determination of informative characteristics of the children in honey milk and milk groups;
- Average; in the determination of wound healing and pain levels of the children in both groups;

- Chi-square test; in the comparison of the informative characteristics of the children in both groups;

- Variance analysis; in the comparison of the wound healing and pain levels of the children in both groups;

- Variance analysis; in the comparison of the wound healing durations of the children in both groups; was used.

The Ethical Side of the Study

In order to conduct this study, the necessary permission was received from Igdir State Hospital Head Physician and the consent was approved by the Ethical Committee of Ataturk University Healthcare Sciences (dated 08.07.2013).

Utmost attention was paid to the voluntary participation of the parents and the children who will participate in the study because the answers should be given voluntarily in all studies to the knowledge. Besides, after explaining the children and their parents in detail the purpose of the study as well as to what extent the acquired results will be used for what purposes, their consents (informed consent principle) were gained orally. To comply with this principle, the consent of the children who were 7 years old or below was gained from either their mother or fathers. The individuals who participated in the study were informed about the fact that the information about them collected within the scope of the study will, by no means, be used anywhere else and “privacy policy” was respected.

Results

It was determined in the study which sought to evaluate the impact of honey milk that was applied to children who went through tonsillectomy operation on hemorrhage, pain and wound healing that the children in milk and honey milk groups were similar in behaviour and terms of gender, age, diet compliance and hemorrhage (Table 1, $p > .05$). It was determined that 51.9% of the children in honey milk group are females and 57.1% are in the 12-16 age group while 51.2% of children in the milk group are males and 56.3% are in the 7-11 age group (Table 1). It was determined that the parents of the children in both milk and honey milk groups were similar regarding the educational status of the mother and family type ($p > .05$) but not similar regarding the educational status of the father, the economic conditions of the families

($p < .05$). 64.7% of all mothers of the children in honey milk group were primary school graduates.

Table 1. The Comparison of The Children in Honey Milk and Milk Groups According to Their Characteristics

Characteristics	Honey Milk		Milk		T* ve p
	S (34)	%	S (34)	%	
Gender					
Boy	20	48.8	21	51.2	$X^2=.061$ p=.500
Girl	14	51.9	13	48.1	
Age					
3-6	12	54.5	10	45.5	$X^2=.968$ p=.616
7-11	14	43.8	18	56.3	
12-16	8	57.1	6	42.9	
Diet Compliance Status **					
Yes	34	100.0	31	91.2	$X^2=3.138$ p=.119
No	-	-	3	8.8	
Hemorrhage Status **					
Yes	-	-	2	5.2	$X^2=2.061$ p=.246
No	34	100.0	32	94.8	

*Test **Column percentage was taken

Table 2. The Comparison of The Characteristics of The Parents of The Children in Honey Milk and Milk Groups

Characteristics	Honey Milk		Milk		T and p
	S (34)	%	S (34)	%	
Educational Status of Mother					
Primary School Graduate	11	64.7	6	35.3	$X^2=2.895$ p=.235
Secondary School Graduate	13	52.0	12	48.0	
High School and above	10	38.5	16	61.5	
Job Status of Mother					
Evet	32	55.2	26	44.8	$X^2=4.221$ p=.042
Hayır	2	20.0	8	80.0	
Educational Status of Father					
Primary School Graduate	20	71.4	8	28.6	$X^2=8.770$ p=.012
Secondary School Graduate	5	33.3	10	66.7	
High School and above	9	36.0	16	64.0	
Job Status of Father					
Yes	3	20.0	12	80.0	$X^2=6.928$ p=.009
No	31	58.5	22	41.5	
Family Type					
Nuclear Family	29	50.9	28	49.1	$X^2=.108$ p=.500
Extended Family	5	45.5	6	54.5	
Economical Level of the Family					
Less income than expenses	18	69.2	8	30.8	$X^2=6.227$ p=.012
Equal income and expense	16	38.1	26	61.9	

*. There is no participant whose income was more than his/her expenses

Table 3. The Comparison of The Wound Healing and Pain Levels of Children in Honey Milk and Milk Groups.

Measurements*	Honey Milk	Milk	T and p	
	X±SS	X±SS		
Pain VAS	10.73±1.58	15.32±1.24	t=13.274	p=.000
Pain Facial Expressions	6.29±.62	8.32±.68	t=12.733	p=.000
Wound Healing TIME	29.94±1.45	23.29±1.64	t=17.661	p=.000

* The average of 5th, 10th and 15th days

Table 4. The Comparison of The Pain Levels of Children in Honey Milk and Milk Groups According to The VAS Measurement

Days	Pain (VAS)		T and p	
	Honey Milk	Milk		
	X± SS	X± SS		
5 th Day	6.17±1.08	7.23±.65	t=4.869	p=.000
10 th Day	3.38±.81	5.66±.64	t=12.680	p=.000
15 th Day	1.17±.38	2.44±1.02	t=6.756	p=.000
T and p	Friedman=64.578 p=.000	Friedman=68.000	p=.000	

Table 5. The Comparison of The Pain Levels of Children in Honey Milk and Milk Groups According to The Measurement of Their Facial Expressions

Days	Pain (FACE)		Test and p	
	Honey Milk	Milk		
	X± SS	X± SS		
5 th Day	3.35±.64	3.82±.38	t=3.645	p=.001
10 th Day	1.97±.30	3.00±.42	t=11.513	p=.000
15 th Day	.97±.17	1.50±.50	t=5.762	p=.000
Test and p	Friedman=66.511 p=.000	Friedman=63.795	p=.000	

Table 6. The Comparison of The Wound Healing Levels of The Children in Honey Milk and Milk Groups According to The Time Measurement

Days	Wound Healing		T and p	
	Honey Milk	Milk		
	X±SD	X±SD		
5 th Day	7.82±.86	5.73±.44	t=12.451	p=.000
10 th Day	10.41±.49	6.58±1.07	t=18.788	p=.000
15 th Day	11.70±.46	10.97±.83	t=4.495	p=.000
T and p	Friedman=68.000 p=.000	Friedman=56.597 p=.000		

Table 7. The Relationship Between the Pain and Wound Healing of Children in Honey Milk and Milk Group.

Measurement	PAIN			
	Pain VAS		Pain FACE	
	r	p	r	p
Wound Healing	-.809**	.000	-.791**	.000

Significant at the level of **001

A 55.2% of the mothers of the children in honey milk group were working; 71.4% of the fathers of the children were primary school graduates and 58.5% were not working. A 50.9% of the children lived in a nuclear family, while 69.2% had less income than their expenses. A 61.5% of the mothers of the children in milk groups were higher education graduate, 80% did not work while, a 66.7% of the fathers were secondary school graduates and 80% did have a job, 54.5% of the children had an extended family and the incomes and expenses of 61.9% were equal (Table 2).

It was identified that all of the children in honey milk group comply with their diets and none of them had any hemorrhage. However, it was determined that 8.8% of the children in milk group did not comply with their diet, and 5.2 % had hemorrhage (Table 1). *“If honey milk is applied to children who went through tonsillectomy operations, hemorrhage decreases”*. Hypothesis H₁ was supported.

It was determined that VAS (10.73±1.58) and facial expressions (6.29±.62) as well as the pain levels along with wound healing (29.94±1.45) level of the children in honey milk groups were better when compared to the VAS (15.32±1.24) and facial expressions (8.32±.68) pain levels along with the wound healing (23.29±1.64) levels of the children in milk groups (Table 3, p<.001).

It was determined that VAS pain levels of the children in honey milk groups was at the top level (6.17±1.08) on the 5th day of tonsillectomy but gradually decreased on the 10th (3.38±.81) and 15th day (1.17±.38) and that VAS pain levels between the days were significantly different (p<.001). (Table 4).

It was identified that VAS pain levels of the children in milk group were at maximum level on the 5th day after tonsillectomy (7.23±.65) but gradually decreased on the 10th day (5.66±.64) and on the 15th day (2.44±1.02) and that the VAS pain level between the days was

significantly different ($p < .001$) on different days (Table 4).

It was determined that the facial expressions of the children in honey milk group were at the maximum level on the 5th day ($3.35 \pm .64$) but gradually decreased on the 10th day ($1.97 \pm .30$) and 15th day ($.97 \pm .17$) and that the pain level between the days was significantly higher ($p < .001$) (Table 5).

It was determined that pain level facial expressions of the children in milk group were at the maximum level on the 5th day after tonsillectomy ($3.82 \pm .38$) but decreased on the 10th day ($3.00 \pm .42$) and 15th day ($1.50 \pm .50$) and that the facial expressions between the days were significantly different ($p < .001$) (Table 5).

It was determined that facial expressions pain level of the children in honey milk group on 5th, 10th and 15th day after tonsillectomy was significantly lower when compared with the facial expressions pain level of the children in milk group on 5th, 10th and 15th days ($p < .001$, Table 5). *“If honey milk is applied to children who went through tonsillectomy operations, pain decreases.”* Hypothesis H_2 was supported.

It was determined that wound healing levels of the children in honey milk group were at minimum level on the 5th day of tonsillectomy ($7.82 \pm .86$) but gradually increased on 10th day ($10.41 \pm .49$) and 15th day ($11.70 \pm .46$) and that wound healing level between the days were significantly different ($p < .001$) (Table 6).

It was determined that the VAS pain level of the children in the honey milk group on the 5th, 10th and 15th day after tonsillectomy was significantly lower when compared to the VAS pain level of the children in milk group on 5th, 10th and 15th days after tonsillectomy ($p < .001$, Table 4).

It was determined that wound healing of the children in honey milk group on 5th, the 10th and 15th day after the tonsillectomy was significantly higher than the wound healing on the 5th, 10th, and 15th of the children in milk group ($p < .001$, Table 6). *“If honey milk is applied to children who went through tonsillectomy operation, it increases wound healing”.* Hypothesis H_3 was supported.

It was determined that wound healing levels of the children in milk groups were at minimum level on the 5th day ($5.73 \pm .44$) but gradually

increased on the 10th day (6.58 ± 1.07) and 15th day ($10.97 \pm .83$) and that the wound healing between the days was significantly different ($p < .001$) (Table 6). It was determined that there is a strong negative relationship between the pain levels of the children in honey milk and milk group ($p < .001$, Table 7).

Discussion

The results of the study that sought to evaluate the impact of honey milk on hemorrhage and wound healing of the children who went through tonsillectomy operation can be generalized with the children with tonsillectomy at 6-17 age range, with no diagnosis of diabetes, who are not allergic to honey and who are fed orally. In our reesearch, we complied with the clinic routine and the children were invited to the clinic on 5th, 10th and 15th day and the evaluation of hemorrhage, pain and wound healing was made during these days. In a seminal study, wound epithalization after tonsillectomy was evaluated on 1st, 4th, 7th and 14th days (Letchumanan et al 2013). According to this study, evaluation on the 5th, 10th and 15th day may present a limitation.

It was determined that the most frequent problem presented by the patients after tonsillectomy is pain and the most prevalent second problem is swallowing difficulties. Even though the duration of healing and re-commencement of consuming normal foods was found as 10 days, the upper and sub limit changed between 7 and 25 days. It was indicated that this case was related with variables such as tissue healing and pain perceptions. In addition to these, the hemorrhages taking place subsequent to tonsillectomy are still considered as a life threatening problem that is encountered frequently (Gunes 2007; Schloss et al 1994; Carmody et al 1982; Randall and Hoffer 1998; Windfuhr 2003; Wei et al 2000; Alexander et al 2004; Krishna and Lee 2001). While the frequency of the secondary hemorrhages taking place after the tonsillectomy was stated as between 2 and 4% (Gunes 2007; Alexander et al 2004; Krishna and Lee 2001; Civelek et al 2009), the hemorrhage rates changing between 8-18 % also exist (Gunes 2007; Collison and Mettler 2000). In addition to the increasing anxiety, secondary hemorrhages also increase the hospital duration and morbidity (Gunes 2007). Similarly, while no child in the honey milk group had any hemorrhage, 5.2 % of the children in milk group had hemorrhage in the study (Table 1). This

conclusion can be explained with the fact that honey milk is a soft and liquid food and does not irritate the operation area while trying to swallow and with the good feeding support that it provides thanks to its content, it accelerates the wound healing and prevents hemorrhage. Another frequent problem arising out of tonsillectomy is pain (Boroumand et al 2013; Salonen et al 2002). The intense pain taking place during this period causes the oral intake to decrease and retards the healing after the operation. The most frequently used medicine to reduce the pain after tonsillectomy, acetaminophen does not relieve the pain completely (Boroumand et al 2013; Moir et al 2000). In a conducted study, it was determined that 90 % of the children who used paracetamol as painkiller after tonsillectomy had pain starting from the first 24 hours till the end of the 7th day and it was necessary to use additional pain killers. There is not enough research that sought to indicate the effectivity and side effects of the pain killers used in addition to acetaminophen after tonsillectomy (Boroumand et al 2013; Bartley and Connew 1994). It has been long known that honey has some biological and therapeutic effects. In literature, there are studies that indicate that honey having positive effects on the treatment of a great number of illnesses was useful in decreasing the pain and complications after oral-farynx operation (Bulut and Tufekci 2013; Bartley and Connew 1994; Chapple 1996; Gendrolis et al 2004; English et al 2004; Ahuja and Ahuja 2010). It was determined that the pain depending on tonsillectomy was reduced with oral honey application (Boroumand et al 2013; Ozlugedik et al 2006; Letchumanan et al 2013) and that honey decreased analgesic need (Boroumand et al 2013). In compliance with these results, it was determined as a result of the study that the pain levels of the children in honey milk group were significantly lower on the 5th, 10th and 15th day both in terms of VAS and facial expressions, when compared with the children in milk group (Table 3, 4, 5, $p < .001$).

The fact that the wound healing after the operation takes a long time increases the risk of infection, increases the unwellness of the patient and has a negative impact on the nourishment of the patient especially because of the scars within the mouth. Wound healing is complex process that includes more than one biological way. For a successful wound healing, adequate amount of blood and foods should get at the damaged area. General state of health and nutritional status of

the patient affects this result that will take place in the damaged tissue. Nourishment is an important part of wound healing. It was determined that the patients whose wounds took some time to heal were generally deficient of nutrients. It was asserted that, in addition to the positive effects such as antimicrobial and antioxidant activities, high viscosity, stimulating the immune system and anti-inflammatory, it prevented the intake of air and accelerated the healing of wounds in the event that it was applied outside. The treatment of the wound using honey, dead cells easily disappear from the wound (Ozmen and Alkin 2006). Nearly 4000 years ago, honey was used for healing the foot scars of Jesus. Even the ancient Egyptians used honey for cornea, conjunctive infection and for burns (Boroumand et al 2013; Salonen et al 2002; Moir et al 2000; Bartley and Connew 1994). The fact that honey is a strong agent used in wound healing is because of its antibacterial and anti-inflammatory effect (Bulut and Tufekci 2013; Molan 2006; Ozmen and Alkin 2006; Medhi et al 2008; Molan 2011; Cooper et al 2001; Natarajan et al 2001; Ahmed et al 2003; Tonks et al 2003; Visavadia et al 2008). The laboratory studies of Ozmen and Alkin (2006) showed that honey is effective against bacteria that are found in *Escherichia coli*, *Staphylococcus aureus*, *Salmonella enterica* and *Serotype typhimurium* (Ozmen and Alkin 2006). It was determined as a result of the study that the wound healing levels of the children in honey milk group on 5th, 10th and 15th day after tonsillectomy was significantly higher when compared to the wound healing of the children in milk group on 5th, 10th and 15th day ($p < .001$, Table 3, 6). Ozlugedik et al. (2006) found out that the wound in the group that was applied with honey after tonsillectomy healed really fast (Ozlugedik et al 2006), Letchumanan et al., (2013) wound epithelialization after tonsillectomy was significantly higher when compared with the placebo group (Letchumanan et al 2013). The results of other studies showed that especially honey has a good impact on the fast healing of burnt, scar and ulcer (Bulut and Tufekci 2013; Medhi et al 2008; Bogdanov 2012; Cooper et al 2010; Molan 2001; Molan 2001; Vardi et al 1998; Subrahmanyam et al 2001; Subrahmanyam et al 2004; Yapucu and Eser 2007; Bell 2007; Adewumi and Ogunjinmi 2011) and on the development of less scar tissue after healing (Bulut and Tufekci 2013; Medhi et al 2008; Bogdanov 2012; Molan 2001; Molan 2001;

Vardi et al 1998; Subrahmanyam et al 2001; Subrahmanyam et al 2004; Yapucu and Eser 2007; Bell 2007; Adewumi and Ogunjinmi 2011).

The number of the studies showing that honey is useful in wound healing after ora-farynx operation is quite many (Bulut and Tufekci 2013; Gendrolis et al 2004; English et al 2004; Ahuja and Ahuja 2010. In the study conducted by Bulut and Tufekci (2013), they applied honey to children who are cancer and receiving chemotherapy whom they included in the experimental group, they determined that 92.9% of the children were fully recovered and that healing level of the 7.1% was better when compared to the control group and identified that there was a significantly different distinction between the experimental and control groups according to mucositis healin status (Bulut and Tufekci 2013). They associated the reason for fast recovery with; the moisture content of the honey (it should be less than 17%) and the low level of PH (many bacteria kinds die because its PH values is between 3.20 and 4.50), with the fact that its low PH value does not give any opportunity for the development of any microorganism (Bulut and Tufekci 2013; Molan 2006; Molan 2011; Molan2001), with high content of sugar, the least amount of water for the microorganisms and the prevention of the reproduction of microorganisms after draining the water in the scar (Bulut and Tufekci 2013; Bogdanov 2012; Alandejani et al 2009), with the bacteriolytic effect of some fitochemical kinds (Bulut and Tufekci 2013; Molan 2011; Alandejani et al 2009; Molan 2001; Molan 2001), with the creation of hygiene effect after the glucose-oxidase enzyme increases the hydrogene peroxide oscillation (Bulut and Tufekci 2013; Sonmez 2004; Molan 2006; Ozmen and Alkin 2006; Molan 2011; Bogdanov 2012) and with the warning of healing procudes by increasing the oscillation of lymphocyte and monocytes (Bulut and Tufekci 2013; Molan 2011; Bogdanov 2012; Molan 2001; Molan 2001). These results are similar to the studies that support the effectiveness of honey in wound healing after the tonsillectomy operation (Bulut and Tufekci 2013; Biswal et al 2003; Motalebnejad et al 2008; Rashad et al 2009; Khanal et al 2010; Salwa et al 2012; Abdulrhman et al 2012).

It was indicated that while honey decreased inflammation and oedema (Bulut and Tufekci

2013; Molan 2006; Tonks et al 2003). It also increased granulation and epithelization (Karadal and Yildirim 2012). This case means that the decrease of inflammation and oedema reduced the pain and accelerated the wound healing. Similarly, it was determined in the study that there is a strong negative relationship between the wound healing levels and pain levels of the children in honey milk and milk group ($p < .001$, Tablo 7).

Conclusion

It was revealed that honey milk which was applied to children who went through tonsillectomy operation prevented hemorrhage, reduced the pain and accelerated the wound healing. Being a natural food, honey can be applied as a safe nursing method for the children who went through tonsillectomy operation, who are fed orally, who have no diabetes and are not allergic to honey.

Acknowledgments

The authors thank the very special and precious children and their parents who participated in the study.

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