

The Effectiveness of Mother Infant Interaction on infantile colic

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ABSTRACT

Introduction: Infantile colic has been defined as episodes of excessive and persistent crying without known medical cause.

Kangaroo mother care is a new method for case of newborn with several advantages. This study designed for evolution KMC and its effect on infantile colic.

Methods: This study is a randomized controlled trial, from 1th may 2008 to 1th may 2009 a total of 70 children, aged 3-12 weeks with persistent colic symptoms that referred to sheikh children hospital (Clinic). Normal mother-infant pairs were recruited at 3 to 12 weeks of age after obtaining baseline for two days. All cases divided randomly to kangaroo care and conventional care group. For analyzing the data we used 2-sample t test, X² test and fisher exact test.

Results: In the beginning of study, the kangaroo care group had 3.5hr/d crying and after the intervention, it decreased to 1.7hr/d, the difference were significant ($P<0.05$). But there were no difference in feeding duration between 2 groups ($P=0.2$). Awake and content (normal behavior) behaviors were significantly increased in the kangaroo care group ($P=0.001$). Sleeping duration was significantly increased in the kangaroo care group ($P=0.02$).

Conclusion: Kangaroo care may use as a simple and safe method for colicky infants treatment.

Keywords: Infantile colic, Kangaroo care, Mother infant interaction

Introduction

Infantile colic has been defined as episodes of excessive and persistent crying without known medical cause (1-4).

The crying appears to peak between 6 and 12 weeks after birth (5). Although infantile colic usually tends to resolve spontaneously within the first 3 months of life, a subgroup of infants show colic symptoms after 3 months of age (6).

Some studies rely on parental reports to define infantile colic (7). But according to Weesel's rule of threes colic is; crying more than 3 hours per day on more than 3 days per week for more than 3 weeks (8).

Estimates of colic prevalence are different from 5% to 40% depending on the definition and method used (9).

We used Modified Wessel's rule in this study.

Unfortunately, the cause of colic is still unknown, which suggests the cause may be multifactorial (8, 10). Although some researchers believe that important risk factor for excessive crying are complicated pregnancy or birth, but the main cause suggested in the literature is cow's milk allergy (1, 11).

Psychological, gastrointestinal, and hormonal explanation for colic's development have been suggested, but consequently, there is contradictory evidence regarding colic's etiology. Colic potential impact on the family the absence of an effective cure, underlines the importance of continued research (12).

Another problem is colic treatment. Unfortunately, there isn't any effective treatment for many patients. Some researches show that infants

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who received skin to skin contact (Kangaroo care), cried and fussed less hours (13, 14).

Kangaroo care originated in Bogotá, Colombia because of a lack of incubators for preterm infants (15). During Kangaroo care the adult holds the diaper clad infant against his/her skin (15).

The infant lies upright on the adult's chest. A breastfeeding mother may allow the infant self-regulatory access to her breast. The adult is without clothing from the waist up; a blanket covers both the infant and adult (14).

KC has three components: 1-Skin to skin contact 2-Exclusive breastfeeding 3-Support to the dyad (mother and infant) (16).

Keefe (1988) confirmed that kangaroo care would decrease the time of the infant spent crying and fussing and increased the time of infant spent sleeping (14).

In this model, interaction between mother and infant is important.

He proposed mother and infant are interdependent units.

And infantile colic is developmental, psychobiological problem (as a developmental sleep disorder.). In this model, colic is viewed as a delay or disturbance in the biorhythmic organization of the infant and colicky infant becomes overly stimulated and overly tired and is less able to initiate a downward shift in state from awake and crying to a sleep state.

This recurrent cycle is theorized in the model to affect the overall interactional synchrony of the mother-infant dyad (9).

This study designed to test the hypothesis that kangaroo care is more effective than conventional care on infantile colic. We used Keefe's model to guide this study.

Material and Method

This study was a randomized controlled trial to assess the effectiveness of kangaroo care in reducing crying/fussing behavior for colicky infants.

From 1 May 2008 to 1 May 2009 a total of 70 children, aged 3-12 weeks with persistent colic symptoms were studied. There were children referred to our clinic because of excessive crying. Sample size calculation indicated 50 participants would need.

Normal mother-infant pairs were recruited at 3 to 12 weeks of age after obtaining baseline for two days. Subjects were randomized to a kangaroo care or conventional care group. In the kangaroo care group, parents were asked to use kangaroo care for at least 2 hours a day. In the conventional care group parent asked to shaking their

infants in the crib. Infant behaviors, including crying and fussing and parental activities directed toward the infant was monitored by diaries completed by the parents at two first day (base line) and continuous for 7 days.

All participating parents gave written informed consent. Infants who were; breastfed, first born, term, more than 2500gr and uncomplicated pre- and postnatal included to study.

Excluding criteria were formula-feeding, illness, congenital anomalies, intra uterine growth retardation, premature birth, low birth weight, low APGAR <8 after 5 minutes), poor feeding, vomiting, constipation. Mother complications like; addiction, illness, hypertension, pre eclampsia, diabetes, prolonged labor.

One trained care giver for kangaroo care recruited for interview and explanation about the study. She was learning mothers for kangaroo care and how recording their baby's behavior and their own activities in base line 48 hours diaries and then visited with researcher and received 7 sheets of diaries for 7 consecutive days and explanation about placing in kangaroo care group or conventional group.

In diaries one complete day was represented on each sheet by four horizontal "time" bars, each subdivided into five minute unites. The upper half of each bar was used for recording infant behaviors of sleeping, awake, contact, crying, fussing and feeding. The lower half was used for recording parental activities of carrying with baby contact, moving with baby but without contact (i.e. in a car).

For this study, colicky infant was defined as one who was "otherwise, healthy and well-fed, but who had paroxysmal of irritability, fussing or crying lasting for 3 or more hours in any one day and occurring on 3 or more days in any one week". We give all mothers 3 free visits and follow up telephone we used (Modified Wessel's rule).

Also we used the Baby's Day Diary was developed by Dr. Ronald Barr to allow researchers to measure infant (and parental) behaviors as recorded by caregivers (17).

This diary has been validated against both audiotape recordings and researcher observations. The Baby's Day Diary, has four, six-hour time-rulers printed on a single page, used to capture babies' behaviors on a 24 hour basis. Caregivers record the onset and end time of successive periods of behavior on the time rulers against a scale showing five minute increments of time. The top section of the time ruler is designated for the infant behaviors while the

Table 1. Gender, Delivery type, Mother age in each group

		Conventional group	Kangaroo care group
Sex	Male	47.8%(11)	24%(6)
	Female	52.2%(12)	76%(19)
Mode of delivery	CS	30.4%(7)	48%(12)
	NVD	69.6%(16)	52%(13)
Maternal age (year)	<20	34.78%(8)	24%(6)
	20-35	43.4%(10)	36%(9)
	>35	21.7%(5)	40%(10)

bottom section is for the parental behaviors. The baby codes are mutually exclusive and represent activities that babies are doing at all times, therefore parents are instructed to complete all 4 rulers with infant behaviors using one of the available codes over the 24 hours. Any missing code in the baby ruler is coded as missing data. On the other hand, the parent ruler does not have to be completed at all times, or can be eliminated altogether if the parent information is not pertinent to the study. In addition, the diary can capture events that happen at specific points in time such as putting an infant on its back to sleep or inserting a pacifier. These can be recorded above the time rulers. (17) The 2-independent-sample t test, X^2 test and the fisher exact test were used.

Results

We admitted seventy babies from 1 May 2008 to 1 May 2009, in our clinic because of infantile colic. At the end of the study only 48 cases completed their forms. Causes of discontinuation were maternal inconvenience including; being too busy, maternal illness or the work of completing diaries regularly.

In our study we divided randomly 48 infants into two groups; 23 cases in conventional group and 25 in kangaroo care group, 35.4% (17) male and 64.46% (31) female (Table1). The age rang was between 3 to 12 weeks and average of age was 7.2 ± 2.3 weeks. There was no significant difference between 2 groups in an age average ($P=0.1$.)

To determine which other behaviors may have been affected, similar analyses were performed post-hoc for feeding, sleeping and awake and content duration.

As expected, kangaroo care changed the

Table 2. Infant behavior in both in each group

Infant behavior	Base line		7 days ago		P
	Conventional group	Kangaroo care group	Conventional group	Kangaroo care group	
Crying duration	3.3hr/d	3.5 hr/d	3 hr/d	1.7 hr/d	($P<0.05$)
Fussing duration	3.2 hr/d	3.1 hr/d	2.1 hr/d	1.1 hr/d	($P<0.05$)
Sleep duration	8 hr/d	8.3 hr/d	9 hr/d	12 hr/d	$P=0.02$
Feeding duration	1.15 hr/d	1 hr/d	1.25 hr/d	1.30 hr/d	$P=0.2$

typical pattern of crying and fussing duration. In the conventional care group the normal crying started at 3.5hr/d and decreased to 3hr/d, after 7 days. In kangaroo care group the normal crying start at 3.5hr/d and decreased to 1.7hr/d and the difference were significant ($P<0.05$).

There were no difference in feeding duration between 2 groups ($P=0.2$). Awake and content behaviors were significantly increased in the kangaroo care group ($P=0.001$).

Sleeping duration was significantly increased in the kangaroo care group ($P=0.02$) (Table2).

Discussion

Prevalence of infantile colic is 5% to 40%; depending on the definition and method used (6) infant colic despite its long history and frequent occurrence is an important difficult for parents (19) and it can trigger physical abuse like shaken baby syndrome (18).

There are many risk factors for infantile colic like; like low gestational age and birth weight, male sex, first born, stress factors, family history of atopy, delivery at home, spontaneous vaginal delivery, complicated pregnancy or birth (8), but there are two main theories on the infantile colic cause in the literature; 1-Cow's milk allergy 2-psychosocial factors that disturbing normal infant-parent interaction (8).

The result of the present study demonstrate that skin to skin contact and kangaroo care was associated with a substantial reduction in the crying and fussing and increase in sleeping and content behaviors in infants (Table 2).

Marshal and Ellet found that kangaroo care increased sleep time and decreased crying and fussing but their sample size wasn't enough because only 5 of 70 subjects complete their study (9).

Their results confirm our study (Table2).

Ludington found that skin to skin contact decreased heel stick pain in preterm infants ($P=0.003$) (20).

Roberts & wilsher showed that maternal and infant interactions is effective on the infant crying peak, the 3 groups moderate, evening and persistent criers and their mothers were assessed at 6 weeks and 5 months of infant age ($P=0.05$) (21).

Recent research showed that non-pharma-

ecological interventions such as "Kangaroo Care" may be useful for decreasing pain in newborns. Saeidi demonstrated that Kangaroo care may be used to decrease pain intensity in newborns undergoing painful procedures such as the pain intensity of vaccination. Mean pain intensity during the intervention was significantly lower in the case group ($P < 0.006$). Mean pain intensity 3 minutes after intervention was also significantly lower in the case group ($P < 0.021$). Mean duration of crying was significantly lower in case group as well ($P < 0.001$) (22).

These studies confirm our results that KC may improve parent-infant interaction and decrease duration of crying and fussing and increased baby sleeping duration, but in our study there was no significant difference between duration of feeding in two groups.

Finally we emphasize, infantile colic is a multifactorial problem and our results cannot rule out another cause and another treatment for this problem.

Conclusion

Kangaroo care may use as a simple and safe method for colicky infants treatment.

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