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Effect of Topical Application of Aloe Vera Gel on Umbilical Cord Stump: A Clinical Trial

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ABSTRACT

***Introduction and Objectives*:** Annually one million newborns die due to the umbilical cord infection. Thus, in this study, we aimed to evaluate the effect of topical aloe vera gel on umbilical cord complications.
***Methods*:** This randomized clinical trial was performed in maternity ward of Ghaem Hospital, Mashhad, Iran The samples were selected through convenience sampling and were randomly divided into three groups of aloe vera, control, and placebo. For data analysis, One-way ANOVA test was conducted.
***Results*:** Comparison of cord condition between the groups showed significant differences between the three groups. In the placebo group, the number of infants with redness around the cord was significantly higher compared to the control (P=0.002) and aloe vera (P=0.002) groups. In addition, cord swelling was significantly more frequent in the placebo group than the control (P=0.002) and aloe vera (P=0.002) groups. The incidence of cord infection was significantly higher in the placebo group than the control (P=0.000) and aloe vera (P=0.000) groups. The occurrence of infection in the umbilical cord of the newborns in the placebo group was significantly more compared to the control (P=0.000) and aloe vera (P=0.000) groups.
Conclusion: Topical aloe vera gel accelerated cord separation and reduced the rates of complications and infections.

Keywords: Aloe vera gel, Drying care, Umbilical cord care

Introduction

Umbilical cord is a suitable place for bacterial colonization (1), and cord infection has caused a huge increase in the rates of morbidity and mortality in the developing countries (2). Because the umbilical artery is a place to direct the release of pathogens into fetal blood circulation, delay in umbilical cord separation can increase bacterial infections; therefore, taking care of the umbilical cord is of great significance. In 1998, the World Health Organization announced that the care of the umbilical cord at birth in the developing countries should be started and continued after hospital discharge (2).

Each year, nearly one million newborns die of infections entering the body through the umbilical cord. According to the available evidence, umbilical cord infection is common in the developing countries, while this complication is rare in the developed ones (3).

In the developed countries, the interventions used to reduce the risk of umbilical cord infection include cleaning of the incision point, washing hands before handling the baby, and bathing the neonate with an anti-bacterial or anti-microbial product (4). In a study by Abbasside, breast milk and dry cord care were found equally effective in caring for the umbilical cord (5).

Different products used to disinfect the umbilical cord are clorohexidin, alcohol, milk, salt, iodine, silver sulfadiazine, and neomycin powder, all of which have antimicrobial properties. Aloe vera has anti-viral, anti-bacterial, and anti-fungal properties and accelerates wound healing (6, 7). Despite the importance of umbilical cord care, studies on traditional or medical care, especially

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in the developing countries are scarce, and given the prevalence of this problem in the developing countries we aimed to investigate the effect of aloe vera gel at the time of cord separation.

Methods

This clinical trial was performed after obtaining permission from the Ethics Committee of Mashhad University of Medical Sciences. The researcher presented at the postpartum ward of the hospital every day. The samples were randomly divided into three groups according to a random number table.1` The standard sample size for each group with 95% confidence interval and 90% power was calculated to be 48.

The inclusion criteria consisted of singleton pregnancy, afebrile, gestational age of 37-42 weeks, birth weight between 2500 and 4000 g, first and fifth minute-Apgar score ≥ 7, lack of any palpable congenital malformations or problems requiring NICU admission or hospitalization, none use of antibiotics, not having a cord so thick that needs to have two clips, not having meconium-stained amniotic fluid, possibility of telephone contact with parents, and parents with basic education.

The exclusion criteria were mother or infant suffering from an infection or fever, other compounds applied to the cord, lack of any treatment for at least one day, manipulating the umbilical cord, the use of antibiotics, unwillingness of parents to participate, and swaddling. For the placebo group we used the basic gel without aloe vera.

The aloe vera gel from the leaves of this plant (10% gel) was prepared in Buali Research Institute, Mashhad University of Medical Sciences. In the aloe vera and placebo groups, the mothers were taught to first wash their hands, and then apply two drops of the gel topically at the base of the umbilical cord three times a day (every 8 hours) until the cord falls off. The mothers were asked to record the cord separation time in a form that was given to them.

The control group did not receive any special care. The mothers were instructed to keep the umbilical cord clean and dry and not swaddle the baby; they even did not use soap and water on the umbilical cord. The mothers were asked to inform the researcher if they observed any inflammation, redness, swelling, pus, or any other symptom in the cord at any time to prevent any complications. The mothers were assured that the only side effect that might occur due to these remedies is sensitivity. To encourage the mothers to cooperate with the study, a free visit to a specialist doctor was provided for them. Sampling was performed by the researcher and research assistant. To analyze the data, One-way ANOVA or equivalent non-parametric tests and post-hoc tests were conducted, using SPSS version 16.

Results

The mean ages of the aloe vera, control, and placebo groups were 7.220±29.840, 6.985±29.500, and 6.687±32.640 weeks, respectively; the groups were not significantly different in terms of mean age (P=0.071).

Comparison of the mothers' educational level among the three groups showed that the majority of the mothers in all the three groups had diploma, and there was no significant difference between the groups (P=0.500). Furthermore, most of the mothers were housewives and there was no significant difference between the groups in this regard (P=0.452). The minimum and maximum umbilical cord separation times were 3 and 20 days, and the mean time was 3.463±9.373 days; the difference between the groups was significant. Tukey's test showed that the separation time in the aloe vera group was significantly less than in the placebo group (P=0.021), and this time in the placebo group was significantly shorter than in the control group (P=0.021).

Cord complications were significantly different between the three groups. Redness around the umbilicus in the placebo group was significantly less than in the control (P=0.002) and aloe vera (P=0.002) groups. Swelling around the umbilicus in the placebo group was significantly more frequent than in the control (P=0.002) and aloe vera (P=0.002) groups. Umbilical cord infection in the placebo group was significantly more prevalent than in the control (P=0.000) and aloe vera (P=0.000) groups. The number of neonates with pus draining from the cord in the placebo group was significantly higher than in the control (P=0.000) and aloe vera (P=0.000) groups.

Maternal satisfaction was significantly different between the three groups

(P=0.000), there was a significant difference between the placebo and aloe vera (P=0.002) groups and the placebo and control groups P=0.002).

Table 1. Comparison of cord complications among the three groups

	Aloe vera	Control	Placebo	All	P-value
Redness	8 (16.6%)	8 (16.6%)	22(45.83%)	38(26.38%)	0.001
Inflation	8(16.6%)	8(16.6%)	22(45.83%)	38(26.38%)	0.001
Pus	8(16.6%)	2(4.16%)	8(16.6%)	18(12.5%)	0.000
Infection	8(16.6%)	6(12.5%)	22(45.83%)	36(25%)	0.000

Discussion

The minimum and maximum times of umbilical cord separation were 3 and 20 days, respectively, and its mean time was 3.463±9.373 days. In the aloe vera group, the separation time was significantly less than in the placebo group, and in the placebo group this time was significantly lower than in the control group. Comparison of cord complications showed significant differences between the three groups; the frequency of redness around umbilicus in the placebo group was significantly higher than in the control and aloe vera groups. Moreover, swelling around the umbilicus in the placebo group was significantly more compared to the control and aloe vera groups.

The number of newborns with umbilical cord infection was significantly higher in the placebo group than in the control and aloe vera groups. The number of infants with pus from the umbilical cord was significantly more in the placebo group than in the control and aloe vera groups. Maternal satisfaction was significantly different between the three groups, that is, there were significant differences between the placebo and aloe vera groups and the placebo and control groups in this regard.

Chitra (1997) performed a study to determine the effect of aloe vera on wound healing in mice. The results showed that collagen content was significantly higher in the groups consuming aloe vera (topical and oral) than among those who did not receive any treatment. Collagen type I-III was higher in the treatment group than in the group not receiving any treatment (P<0.001). Increased collagen content in the groups receiving topical treatment and oral therapy were 93% and 67%, respectively; furthermore, aldhydrat content of aloe vera in the two groups were 42% and 30%, respectively (8). In that study, collagen content and aldehydrat determined that the criteria are indicative of wound healing and its results confirmed our findings. In our study, cord separation time in the aloe vera group was significantly lower than in the placebo and control groups.

Avizgan (2004) carried out a clinical trial to determine the effect of aloe vera gel on bed wound. He found a significant difference in the mean duration of lesions before treatment with aloe vera gel and after treatment with this remedy (P=0.000) (9). T-test reflected a significant difference between the groups in terms of the mean time it takes to reduce discharge and swelling of the wound, but for the average time it takes to diminish redness and heal wounds showed no significant difference was noted. The results of this study showed the positive effect of aloe vera gel on wound healing and shortening the time required for wound healing that confirms our results; however, that study was related to chronic wounds, which is different from our study. Redness, swelling, and infection in our study were also less in the aloe vera gel group versus the placebo group.

Jarrahi (2009) in a study to determine the effect of aloe vera gel on skin incisional wound healing proposed that in rats treated with aloe vera gel wound healing accelerated by 75%, and measurements showed that the mean improvement in wound healing on the eighth, tenth, and twelfth days compared to the control group were significantly different (P<0.05) (10). The results of this study indicated that aloe vera gel accelerated wound healing and confirmed the results of our study.The results obtained by Julian were not consistent with ours, although the number of samples in his study was very limited and this could affect his study findings (11). This is the first attempt evaluating the effect of topical application of aloe vera gel on cord separation. In this study, the efficacy of aloe vera gel was approved by an appropriate method. In this way, of course satisfaction was lower in placebo versus the control and aloe vera groups that can be improved after mother awareness.

Conclusion

Topical application of aloe vera gel shortens the umbilical cord separation time and reduces the rate of complications and infections; however, some cultural work should be done in this area.

Acknowledgments

No

Conflicts of interests:

No

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