

# Comparison between Two and Twenty-four Hours Salt Powder in Treatment of Infant Umbilical Granuloma

AS Farhat\*, A Mohammadzadeh

Department of Pediatrics, Mashad University of Medical Sciences, NICU Emam Reza Hospital, Mashad, Iran

## Abstract

**Background:** One of the most common umbilical abnormalities in neonates is umbilical granuloma, causing inflammation and drainage. The common treatment is application of a 75% silver nitrate stick. This study was carried out to compare the effect of 2 and 24 hours salt (NaCl) in treatment on infant umbilical granuloma.

**Methods:** From January 2004 to January 2006, at Neonatal ICU and Infant Follow-up Clinic of Imam Reza Hospital, Mashad University of Medical Sciences, Mashad, Iran, two groups including 20 infants with umbilical granuloma undergoing a 24 hours treatment with salt as the case group and 20 infants undergoing a 2 hours treatment with salt as the control group were compared.

**Results:** There were 18 boys and 22 girls. The treatment days in case and control groups were  $1.2 \pm 0.6$  and  $2.1 \pm 0.4$ , respectively and the difference was statistically significant. In either group, there were no significant differences between sex, birth weight, time of umbilical separation and age of enrollment.

**Conclusion:** 24-hours treatment of umbilical granuloma with salt was shown to be more effective than the 2-hours treatment method.

**Keywords:** Granuloma; Salt; Infant; Treatment

## Introduction

Umbilical granuloma is the most common umbilical abnormality in neonates, causing inflammation and drainage. The majority of umbilical granulomas of the newborns fail to epithelialize and persist for more than two months. The common treatment is application of a 75% silver nitrate stick.<sup>1</sup> In another study, it was shown that 2-hours treatment of neonate umbilical granulomas with salt was more effective than silver nitrate application.<sup>2</sup> However, longer exposure of umbilical granuloma to salt has not been reported. Therefore, in the present study, we compared the 2-hours versus 24-hour treatment method of umbilical granuloma with salt.

## Materials and Methods

From January 2004 to January 2006, this clinical trial was performed in two Neonatal ICU and Neonate Follow-up Clinic of Imam Reza Hospital affiliated to Mashad University of Medical Sciences, Mashad, Iran. Forty infants were enrolled and divided into two equal groups of treatment (case) and control groups. In the case group, the neonates' umbilical granulomas were completely covered with powdered salt (NaCl) after cleaning with a cold boiled-water (the amount of powdered salt was not important).

Granuloma size was divided into two small and large types. The small granuloma was completely covered by umbilical ring, but the large one was not. Since the complete coverage of the large umbilical granuloma with salt was not possible, the partial coverage was tried for 24-hours.

During this period, the parents were instructed not to wash or clean the salt. Every 24 hours, the neonates were visited by one of the researchers and the

\*Correspondence: Ahmad Shah Farhat, MD, Assistant Professor of Department of Pediatrics, Neonatal Research Center, NICU Emam Reza Hospital, Mashad, Iran. Tel: +98-511-8521121, Fax: +98-511-8525317, e-mail: [farhata@mums.ac.ir](mailto:farhata@mums.ac.ir)  
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healing process was recorded (healing was defined as complete necrosis and deletion of umbilical granuloma). If there were no sign of healing, the treatment with salt continued until full recovery was achieved. In the control group, the neonates' umbilical granulomas were covered with salt for 2 hours after thorough cleaning with cold boiled water followed by a visit after 24 hours. The results were recorded (after 2 hours salt was completely washed and cleaned with cold boiled water), and the infants in both groups were followed until complete healing of granulomas.

In both groups, the infants' gestational age, sex, weight and enrolment time were recorded.

The study was approved in institution Ethics Committee and a written consent was provided from each participant. Data were analyzed with the Statistical Package for Social Sciences (SPSS version 10.5). Numerical variables were compared between the case and control groups, using independent student's test. Values less than 0.05 were considered statistically significant.

## Results

In the case and control groups (each 20 neonates), 9 were male (45%) and 11 were female (55%). Two neonates in the case group and one in the control group were preterm. Two and one, of the granulomas in the case and control groups were large in size respectively and the remained had a small size.

There was no significant difference between the two groups regarding the age, birth weight and time of umbilical separation (Table 1). The frequency of application of for treatment of granuloma was comparable in both groups, being  $1.2 \pm 0.5$  times for the 24-hour treatment group and  $2.1 \pm 0.4$  times for the 2-hour treatment group (1-3 times) which was significantly different ( $P=0.001$ ). In both groups, no treatment failure and salt side effects or complications were observed.

## Discussion

During the first postnatal days, the umbilical cord becomes yellow and dry, then turning into brown and brittle and usually falling off on the second week.<sup>3,4</sup> Histological granuloma is defined as a space occupying lesion composed of histocytic cell aggregation,<sup>5</sup> but the umbilical granuloma of the newborns characterized by delayed irregular separation of cord stump often results in the persistence of exuberant granulation tissue in the umbilicus.<sup>4</sup> On the other hand, the granulation tissue may produce delay epithelisation on the infant umbilicus.<sup>6</sup>

In the present study, the 24-hour treatment of umbilical granuloma was more effective than the 2-hour treatment and no complications or side effects were observed in either treatment method. In a study carried out in Hamedan, Iran by Farhat, it was shown that salt is effective for the treatment of umbilical granuloma.<sup>2</sup>

In another study, we showed that infants' umbilical granuloma treatment with salt was more effective with no complications as compared with silver nitrate stick. For umbilical granuloma, the most commonly used treatment method is silver nitrate 75% cauterization. The silver nitrate acts as an antiseptic, astringent or caustic agent depending on the concentration. The peri-umbilical skin burn is a complication of silver nitrate treatment.<sup>2,8</sup> Other treatments are cryosurgery, surgical excision and double ligature of umbilical granuloma.<sup>9,10</sup> The treatment of umbilical granuloma with salt causes no complication, especially the peri-umbilical skin burn.<sup>2</sup> The 24-hour treatment with salt used in this study caused no complications. The present study demonstrated that 24-hour salt treatment of umbilical granuloma was more effective than 2-hour treatment, without any complications.

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**Table 1:** The infants birth weight, time of umbilical separation, age of enrollment and complications, means and p-value comparison in 2-hour and 24-hour salt treatment at Neonatal ICU of Imam Reza Hospital, Mashad, Iran from 2004-2006.

Variables0	Control (n = 20 ) Mean ± SD	Case (n=20) Mean ± SD	P value
Birth weight (gr)	3142.5±470.6	3107.5±588.0	0.836
Time of umbilical separations (day)	9.3±3.1	9.4±2.8	0.873
Age of enrollment (day)	22.8±13.6	26.8±13.2	0.904
Complications	-	-	-

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**Conflict of interest:** None declared.

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