



ORIGINAL ARTICLE

Comparison between silver nitrate and table salt in the treatment of umbilical granuloma.

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ABSTRACT... Objective: To compare the efficacy of table salt with silver nitrate in the treatment of umbilical granuloma presenting to the neonatal unit/paediatric department KTH. **Study Design:** Randomized Controlled Trial **Setting:** Neonatal Unit of Khyber Teaching Hospital. **Period:** November 2019 to November 2022. **Methods:** A total of 120 patients who presented to the neonatal unit/paediatric department, aged 15-60 days were enrolled in this study via consecutive sampling. Seventy-five patients each, were allocated to two groups, Group A (common salt) and Group B (silver nitrate). Sixteen patients from Group A whereas, in Group B, 17 patients were lost to follow-up. **Results:** A total of 58 out of the remaining 117 patients were female whereas 59 patients were male. Treatment response was recorded for both groups. The cure rate was greater among Group B (93%) as compared to Group A (88%) but there was no statistically significant difference between Group A and B in treatment response ($p= 0.35$). **Conclusion:** Table salt is a cheaper, easily accessible, and safe alternative to topical silver nitrate in the treatment of umbilical granuloma.

Key words: Silver Nitrate, Table Salt, Umbilical Granuloma.

INTRODUCTION

An umbilical granuloma is a benign abnormality of the umbilical cord. It results from the persistence and proliferation of granulation tissue at the base of the umbilical stump.¹ The exact cause is not known but many factors are attributed to its causation, including omphalitis, friction, poor hygienic conditions, and keeping the area wet.² The cord usually separates between 5 and 15 days after birth. Before the separation, the remaining stump can be considered as a healing wound and thus a possible route for infection through the vessels into the baby's blood stream.³ Multiple treatment options are available like silver nitrate application, dry cord care, alcohol wipes, common salt, cryosurgery, topical steroids application, and double ligature surgery.⁴ The most widely practiced method is silver nitrate cauterization. There are a lot of opinions in favor and against each method.¹ Some authors strongly recommend silver nitrate because of its efficacy and being used for long.^{1,5} While others

are against silver nitrate because of its caustic nature, with a significant risk of burns to the surrounding skin.^{4,6} Similarly, for common salt, some investigators have strongly recommended it because of its easy availability, no cost, and no risk of burns, while others are concerned about its efficacy.^{5,7,8}

We want to conduct this study because common salt is easily available, costs minimum and can be easily applied by parents at home, and is nearly free of serious side effects. Although there are studies in favor of the literature, no one has studied its feasibility in the local setup. This study will help to minimize the sufferings of parents and will help practitioners dealing with neonates.

OBJECTIVE

To compare the efficacy of common salt with silver nitrate in the treatment of umbilical granuloma presenting to the neonatal unit/paediatric department of Khyber Teaching Hospital.

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Operational Definitions

Cure

Stopping of oozing from the umbilical stump at 5th day of intervention.

Failure

Failure to stop oozing at 5th day of intervention.

Loss to follow up

Not coming for follow up or/and not responding to phone calls.

METHODS

This study was a randomized controlled trial carried out between November 2019 to November 2022 in the Pediatric department of Khyber Teaching Hospital. A total of 120 children who presented to the neonatal unit aged between 15 and 60 days whose umbilical cord detached at least 48 hours ago with no other congenital malformations were included in the study via consecutive sampling. Patients with signs of omphalitis were excluded from the study.

This study was approved by the Ethical Review Committee of Khyber Medical College under the Declaration of Helsinki (637/ADR/KMC). Patients were enrolled after consent was taken from the parents.

After taking informed consent, patients were enrolled in the study. They were randomly allocated to two groups via blocked randomization of 60 per group. Group A was treated with common salt/table salt. Group B was treated with a 75% silver nitrate strip. In group A, 1st application was done in front of parents/educated attendants, and they were asked to repeat the same in the morning and evening for 5 days or till the resolution of oozing, whichever is earlier. After cleaning, a pinch of common salt was placed on the granulation tissue and the umbilical stump was closed with nichiban for 60 minutes. After 60 minutes the umbilical stump was washed with warm water and kept dry for the remaining time, until the evening when the same procedure was repeated. After two days the parents were called for a follow-up to check their compliance and procedure. In group

B, after cleaning and drying the area, 75% silver nitrate was applied to the granulation tissue for 10 minutes. After that patients were sent home and called after two days, and then 5th day, for follow-up, to check the cure rate and any need for 2nd application. Stoppage oozing at day 5 from the umbilicus was considered as cured in both groups. Those who did not come for follow-up were called via phone contact, at day 3 and day 6, to record the cure rate in both groups.

Data were analyzed by SPSS version 20. Continuous variables were expressed as mean \pm SD and compared via t-test. Categorical variables were expressed in percentages and compared via the chi-square test. A p-value of < 0.05 was considered significant.

RESULTS

A total of 120 patients aged 15-60 days were included in the study. Patients were allocated to 2 groups as mentioned above. From Group A (common salt), 1 patient, and in Group B (silver nitrate), 2 patients were lost to follow-up. A total of 58 out of the remaining 117 patients were female whereas 59 patients were male. Treatment response was recorded for both groups. Group A had an 88% recovery rate whereas, in Group B, it was 93% (Figure-1).

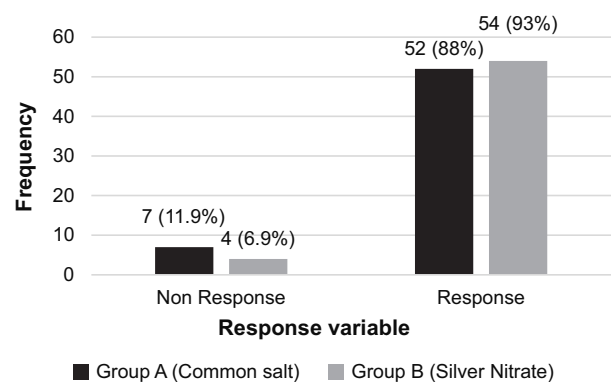


Figure-1. Treatment vs Response

The cure rate was greater among Group B (93%) as compared to Group A (88%) but there was no statistically significant difference between Group A and B in treatment response ($p= 0.35$). There was also no statistically significant difference regarding gender among both groups ($p= 0.7$) (Table-I).

Variables	Group	Treatment Response				chi-square (DF)	P-Value
		No		Yes			
		N	%	N	%		
Treatment Group	Common salt	7	11.9%	52	88.1%	0.847 (1)	0.357
	Silver Nitrate	4	6.9%	54	93.1%		
Gender	Female	6	10.3%	52	89.7%	0.120 (1)	0.729
	Male	5	8.5%	54	91.5%		

Table-I. Treatment response of common salt vs silver nitrate

DISCUSSION

An umbilical granuloma is the persistence of pinkish moist granulation tissue with oozing of clear to yellowish fluid.⁹ In resource-poor areas, a reliable, cheap, easily accessible treatment option should be available for the treatment of umbilical granuloma to avoid complications such as omphalitis and sepsis.¹⁰

Topical silver nitrate is recommended as the first-line treatment of umbilical granuloma.⁹ It acts as an antibacterial with caustic features, leading to the shrinkage of granulatous tissue.¹⁰ Another reported method is the excision of the granulation tissue but it has a greater chance of recurrence and bleeding.¹ Treatment of umbilical granuloma with salt was proposed initially in 1972.¹¹ Salt creates an osmolality difference leading to desiccation and eventually separation of the granuloma.^{10,12,13}

Burns are a common complication of silver nitrate application due to spillage to surrounding skin.^{6,14} Other challenges in the application of silver nitrate are that a medical professional is needed for proper application¹⁰, whereas, no side-effects have been reported by application of salt.^{7,10,15}

In our study, the cure rate was 88% after applying common salt to the umbilical granuloma twice daily for 7 days. Some studies reported a recovery rate of 55%-88% when common salt was applied twice daily for 3 days^{5,16} whereas some reported it to be 96%-100% with a period of 5 days.^{8,17} Another study reported a cure rate of 91.7% with twice daily application of salt for 3 weeks. It was argued in that study that the remaining patients who did not recover were actually misdiagnosed and therefore the cure rate was 100%.⁷

In this study, the cure rate for umbilical granuloma after a single application of silver nitrate was 93%

and no complications were observed. Other studies reported a recovery rate of up to 81% after a single application of silver nitrate with a complication rate of 2.7%.¹⁰ Similarly, another study has reported a similar cure rate to our study i.e. 91% but also with a higher complication rate i.e. 18.8%.¹⁸

Common salt is a safe alternative to topical silver nitrate in the treatment of umbilical granuloma. It is cheap and easily available^{10,14} whereas, in comparison, silver nitrate costs more than common salt.¹⁸ Further studies at a large scale are required to confirm our findings as well as to investigate the cause of failure to recover among the treatment modalities used.

CONCLUSION

In our region where there are limited resources including medical personnel, treatment of umbilical granuloma with common salt is a better option as compared to silver nitrate cautery.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

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2	Muhammad Kashif	Data interpretation, Manuscript writing, Critical review.	
3	Syed Mohsin Ali Shah	Collection of references, Revision of manuscript.	
4	Tabinda Shadab	Collection of references, Critical review.	
5	Romisa Rehman	Critical review, Final checking of manuscript.	
6	Faizan Sadiq	Revision of manuscript, Critical review.	