Chattagram Maa-O-Shishu Hospital Medical College Journal
Volume 24, Issue 2, July 2025

Original Article

Topical Application of NaCl Tablet in Treatment of Umbilical Granuloma

Kazi Md Noor-ul Ferdous[1*]
Tamima Hossain[2]
SM Mahmud[1]
Md. Delwar Hossain[1]

[1]Division of Pediatric Surgery
Bangladesh Shishu Hospital & Institute
Dhaka, Bangladesh.

[2]Department of Pediatric Surgery
Sir Salimullah Medical College Mitford Hospital
Dhaka, Bangladesh.

Abstract

Background: *Umbilical Granuloma is a benign abnormality of the umbilicus and can be defined as a moist, fleshy, and pink granulation tissue at the center of the umbilicus. Considering the safe and effective treatment of umbilical granuloma more recently common salt or NaCl tablets are gaining popularity over conventional methods of chemical cauterization with copper sulphate. Therefore, this study aimed to determine the outcome of NaCl tablets in managingUG.*

Materials and methods: *This was a retrospective study and was conducted in the Department of Pediatric Surgery, Bangladesh Shishu Hospital and Institute and other two Private Clinics in Dhaka, Bangladesh during the period from July 2020 to June 2022. In our study, we included 80 patients with clinically evident umbilical granuloma who sought treatment from the investigators and NaCl tablet powder was applied tropically for the treatment.*

Results: *The mean age was 9.88±9.7 weeks. Most (58%) of our patients were male. At the end of the 3rd day, 7th and 28th day, complete regression was found in 76.67%, 81.67%, and 91.67% of cases respectively. The common side effects were local irritation (3.33%) and wound infection (0.83%). At the last follow-up, no recurrence was found in our study patients. The majority (96.67%) of patients showed excellent response to the treatment.*

Conclusion: *In our study, we showed that topical application of NaCl tablet powder could be a good alternative for treating neonatal umbilical granuloma due to its simplicity, safety, and effectiveness. Applying common salt is an easy, and reasonably priced therapy option that doesn't include synthetic drug use or surgical side effects.*

Key words: Infants; NaCl tablet powder; Umbilical granuloma.

INTRODUCTION

Umbilical Granuloma (UG) is a benign abnormality of the umbilicus and can be defined as a moist, fleshy, and pink granulation tissue at the center of the umbilicus.[1,2] It is an overgrown tissue that develops during the healing process of the umbilicus and typically remains in the umbilicus after cord separation, where normal healing should have happened.[3] It is reported as the most frequent disorder originating from the umbilicus in newborns.[4,5] In one study, the prevalence of umbilical granuloma was reported to be 1 in 500 newborns.[2] Although the exact cause of umbilical granuloma is not known, the formation of the granuloma can be related to both an inflammatory process and a delay in the umbilical cord separation.[6]

After delivery, the umbilical cord normally separates after 7–10 days, and occasionally granulation tissue growth at the umbilical base might result in partial

*Correspondence to:
Dr. Kazi Md. Noor-ul Ferdous
Associate Professor
Division of Pediatric Surgery
Bangladesh Shishu Hospital & Institute
Dhaka, Bangladesh.
Mobile : +88 01711 32 24 87
Email : kmnferdous1971@gmail.com

Date of Submission : 03.02.2025
Date of Acceptance : 19.07.2025

www.banglajol.info/index.php/CMOSHMCJ

epithelialization. The resolution of normal granulation tissue of the umbilical stump should disappear during the 2nd or 3rd week after labor.[7] Granulation tissue can develop considerably at the umbilical area and results in granuloma, which is usually detected by parents after the cord separation because of the drainage of serosanguinous or serous fluid or persistent moisture around the umbilicus. Persistence of granuloma after the 3rd week will necessitate treatment.[7]

Despite the expensive cost, conventional treatment of umbilical granulomas with silver nitrate is widely used around the world. Silver nitrate has great antibacterial qualities, but it is also astringent and caustic. These effects are what give silver nitrate its therapeutic qualities, but if it comes into contact with healthy tissues, it may cause damage.[8-11] When principal textbooks on pediatrics and Neonatology were reviewed, it is unfortunate that silver nitrate application is advocated as a first-line treatment option, and other non-invasive approaches almost are not mentioned.[8] Other treatment modalities include surgical electrocauterization, cryocauterization, and surgical excision. However, all treatment modalities have advantages and disadvantages, especially complications and recurrences.[12-15] Schmitt first proposed using common salt to treat umbilical granuloma in 1972 and Kesaree elaborated on the concept in 1983. This clinical occurrence happened when a newborn with an umbilical granuloma was treated with silver nitrate, and the surrounding skin acquired extensive superficial burns.[16,17] Some literature reviews support various management strategies, including salt therapy, although evidence-based studies are rare.[8]

Based on the literature now available, salt treatment is likely to be safe and effective in most situations, although some consultant neonatologists have voiced reservations about using salt without first consulting a medical professional.[17]

Although the silver nitrate application is the most prevalent one among all other treatment options, it also has several significant drawbacks.[8] Therefore, rather than applying silver nitrate, medical professionals look for various alternate solutions for managing UG. Seeking these alternative options of management was prompted by a few cases that did not respond well to the application of silver nitrate, the need for medical professionals to administer it, the possibility of periumbilical burns from chemical cauterization, certain side effects resulting from the contraindications for bilateral ligations and their associated complications, the expense, and the scarcity of silver nitrate.[8, 14]

The preliminary data about salt treatment is derived from lower-quality research carried out in developing countries.[18,19] Nonetheless, the outcomes of this pragmatic approach seem to be reliable and point to a successful clinical conclusion. While several techniques have been established for applying salt, the fundamental ideas remain the same.[20, 21] The infant has no pain during this non-invasive operation, and it doesn't need to be repeated at home or in the hospital. After cleaning the umbilical area with a moist cotton pad, the granuloma is sprinkled with a small amount of crystal salt. The granuloma is then sealed shut using an adhesive drape. Thirty minutes after the procedure, the application process is finished and the drape is opened.

For three days in a row, this technique is repeated three times a day. In their research population, Kesaree et al. claimed a 100% success rate.[19] In the context of the safe and efficient management of umbilical granuloma, common salt or NaCl tablets are becoming more and more preferred over traditional chemical cauterization techniques using copper sulfate. Therefore, in this study, we aimed to determine the outcome of topical application of common salt in the treatment of umbilical granuloma.

MATERIALS AND METHODS

This was a retrospective study and was conducted in the Department of Pediatric Surgery, Bangladesh Shishu Hospital and Institute and other two Private Clinics in Dhaka, Bangladesh during the period from July 2020 to June 2022. In our study, we included 80 patients with clinically evident umbilical granuloma who sought treatment from the investigators, and NaCl tablet powder was applied topically for the treatment. These are the following criteria to be eligible for enrollment as our study participants: ● Patients aged between 2 weeks to 48 weeks ● Patients diagnosed with umbilical granuloma ● Patients who were willing to participate were included in the study and ● Patients with omphalitis or umbilical sepsis ● Patients with known allergy were excluded from our study.

Common salt or table salt is a refined salt containing about 97 to 99 percent Sodium Chloride (NaCl) and 3 to 1 percent of iodized salt, containing Potassium Iodide (KI), is widely available. Therefore, in the current study, we used a NaCl tablet to get the pure form of common salt.

As the procedure is painless and noninvasive for the patient, does not require frequent medical visits, can be done at home. First, NaCl table (300mg) the tablet is crushed in a clean paper fold. Before application umbilical area is cleaned with a wet cotton pad, and then a pinch of crashed tablet is sprinkled on the granuloma. Then granuloma is closed with an adhesive drape, and opened after 30 minutes. Then cleaned with normal saline or clear normal temperature boiled water. Parents were taught the procedure and advice to repeat 3 times a day for 3 consecutive days.

All infants were re-evaluated after 3 days, 7 days, and 28 days following the last application. During each follow-up visit, complete resolution, recurrence, and side effects such as wound infection and local irritation were noted.

All data were recorded systematically in preformed data collection form. Quantitative data was expressed as mean and standard deviation. Qualitative data was expressed as frequency distribution and percentage. The study was approved by the Ethical Review Committee of Bangladesh Shishu Hospital and Institute.

RESULTS

At the end of the follow-up period, 80 participants were included in the final data analysis. After completion of the data analysis, the results were organized in tabular form. The tables are described as follows:

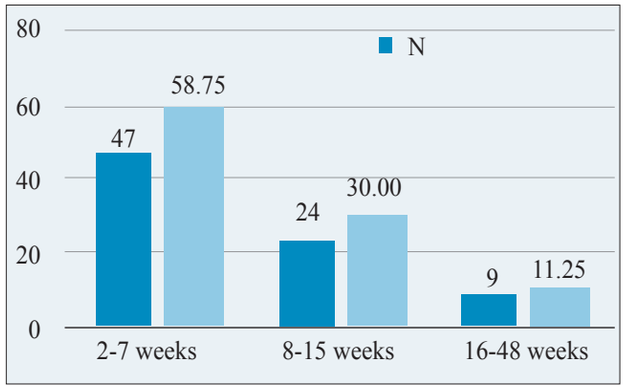

Figure 1 Age distribution of the participants (n=80)

Figure 1 shows the age distribution of the study subjects, age ranged from 2 weeks to 48 weeks. The mean age was 9.88±9.7 weeks. Maximum patients (58.75%) were aged 2 – 8 weeks, followed by 30% were aged 8-15 weeks and 11.25% were aged 16-48 weeks.

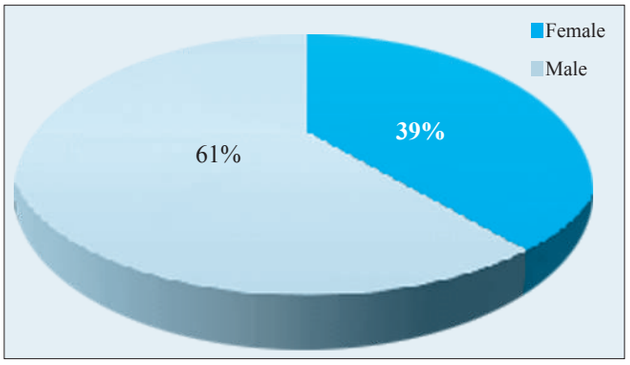

Figure 2 Gender distribution of the participants

The pie chart shows that most (61%) of our study patients were male and 39% were female. We found male and female ratio was 1.58:1 in this study.

Table I Complete resolution of respondents patients at the end of 3 days, 7 days and 28 days (n=80)

Complete resolution	At the end of 3 days		At the end of 7 days		At the end of 28 days	
	No	P (%)	n	P (%)	n	P (%)
Yes	69	86.25	72	90.00	75	93.75
No	11	13.75	8	10.00	5	6.25
Total	80	100.00	80	100.00	80	100.00

Table I shows the complete resolution of our study patients. At the end of 3rd day, complete regression was found in 86.25% of cases. At the end of the 7th and 28th day, complete regression was found in 90% and 93.75% of cases respectively.

Table II Distribution of the respondents by their side effects and recurrence rate

Side effects	No.	Percent (%)
Local irritation	4	5.00
Wound infection	1	1.25
Recurrence		
Yes	0.00	0.00
No	80	100.00

Table II shows the side effects and recurrence rate of study patients. At the end of 28 days of follow-up, local irritation 4(5%) and wound infection 1(1.25%) were found. At the end of the period, no recurrence was found in our study patients.

Table III Distribution of the study patients by their response to the treatment

Response	No.	Percent (%)
Excellent	77	96.25
No response	3	3.75

In Table III we found that most (96.25%) of the study patients showed excellent responses to the treatment, whereas only 3(3.75%) patients showed no response.

Figure 3 NaCl tablet, umbilical granuloma, application and follow up after 3 days (Clockwise)

DISCUSSION

An Umbilical Granuloma (UG) is a widespread umbilical medical problem in infants, which, if left without treatment, might ooze and become irritating for numerous weeks. There are different curative management of this medical condition, but each method has advantages and disadvantages.[11] There is evidence that an agent causes no problems and has a curative effect. In this case, the topsell application of common table/cooking salt or NaCl tablet powder is an effective treatment for umbilical granuloma. The first indications for salt treatment are based on the data, which appear to be reliable and imply a positive clinical outcome. Different methods for salt applications have been advocated, all of which follow similar general principles. This technique is

easy and conservative, and it does not necessitate routine medical appointments.[20] UG is a minor condition with no recognized associated anomalies that can effectively be managed by the topical application of NaCl (Common salt). Salt reduces granuloma inside the occluded hyperosmolar chamber through a variety of biological mechanisms, such as the desiccant effect. In addition, the high concentration of sodium ions in the area draws water out of the cells, causing the wet granulation tissue to contract and necrotize. These are not very pleasant effects, but when used for a brief period, they do not damage the normal adjacent stratum corneum.[21-23] The world of medicine has witnessed significant transformation in recent years.[24] A lot of important information regarding popular health beliefs was discovered. Many popular health beliefs were found to be accurate and should be reinforced, but some were shown to be hazardous to the newborns' health, such as applying chemicals to the umbilical stump.[25]

In this study, a total of 80 infants were selected and treated with common salt following a standard guideline available. Their ages ranged from 2 weeks to 48 weeks. To collect these infants, this study was carried out over 2 year's duration.

A slight predominance of the male sex of infants was observed in the study, but other studies showed the incidence of umbilical granuloma was the same in boys and girls.[26,27]

In this study, 96.25% of patients were cured. In other studies, it was even 100%.[7,19]Halder Al et al found that 97% of their patients were cured by salt treatment.[28]

A prospective study done by Hossain et al. found that table salt application resulted in excellent outcomes in 91.7% of their patients. Although the group receiving silver nitrate treatment showed positive outcomes, the authors did not advise it due to minor burns and discomfort at the umbilicus experienced by a few patients.[21]

According to Sözen et al., applying table or cooking salt to the umbilical pilonidal sinus in patients with granuloma is a straightforward, very successful therapeutic method that doesn't cause any side effects or relapse.[23] The study's findings demonstrated that, in addition to being inexpensive and simple to administer, common salt can be used to treat umbilical granuloma without causing any complications.

However, comparable symptoms may be present in other umbilical disorders, including umbilical polyps, making it challenging to differentiate them clinically. Additionally, there can be a local umbilical infection linked to more serious abnormalities and cannot be treated with common salt.[28] When treated with common salt, umbilical granulomas often go away in three to five days. It is advisable to seek surgical assistance if the condition is not fully resolved in this period.

LIMITATIONS

Our study was a single-center study. We took a small sample size due to our short study period. We could not make sure that the parents applied the common salt in UG as guided. The salt that we used in the study was not 100% pure and it was mixed with a very small amount of KI and its effect couldn't be evaluated. After evaluating those patients, we did not follow up with them for the long term and do not know other possible interference that may happen in the long term with these patients.

CONCLUSIONS

This study showed that applying common salt topically could be a good alternative for treating neonatal umbilical granuloma due to its simplicity, safety, and effectiveness. Applying cooking salt, also known as common salt, to the umbilical granuloma is an easy, very successful, and reasonably priced therapy option that doesn't include synthetic drug use or surgical side effects. Above all salt can be applied by guardians at home.

RECOMMENDATIONS

In nations with low resources where access to drugs and medical specialists is scarce, salt treatment may be an affordable, safe, effective, and available option.

Further study with a prospective and longitudinal study design including a larger sample size needs to be done to prove the therapeutic effect of common salt in the management of umbilical granuloma.

DISCLOSURE

All the authors declared no competing interest.

REFERENCES

1. Kluwer W. Steadman's Medical Dictionary. 28th ed. USA: Lippincott Williams & Wilkins. 2006.
2. O'Donnell KA, Glick PL, Caty MG. Pediatric umbilical problems. PediatrClin North Am. 1998; 45(4): 791-799.
3. Assi AN, Kadem MK. Management of umbilical granuloma. Thi-Qar Medical Journal (TQMJ). 2010;4(4):82–87.
4. Rennie JM. Examination of the newborn. In: Rennie JM, editor. Rennie&Roberton's Textbook of Neonatology. 5th edition. India: Churchill Livingstone Elsevier. 2012;254-255.
5. Hossain AZ, Hasan GZ, Islam KD. Therapeutic effect of common salt (table/cooking salt) on umbilical granuloma in infants. Bangladesh J Child Health. 2010; 34(3): 99-102.
6. Pomeranz A. Anomalies, abnormalities and care of the umbilicus. PediatrClin North Am. 2004; 51(3): 819-827.
7. Saleh ASA. Therapeutic effect of common salt on umbilical granuloma in infants. Int J Med Sci Public Health. 2016;5: 911-914.
8. Karaguzel G, Aldemir H. Umbilical granuloma: Modern understanding of etiopathogenesis, diagnosis and management. J Pediatr Neonatal Care. 2016;4(3):1–5.
9. Badebrarin D, Jamshidi M, Aabadi SA et al. A comparison between the clinical results of salt therapy and surgery in the treatment of umbilical granuloma in infants. Iran J Pediatr Surg. 2018;4(1):1–13.
10. Poenaru D. Disorders of the umbilicus in infants and children: A consensus statement of the Canadian Association of Pediatric Surgeons. Pediatr Child Health. 2001;6(6):312–313.
11. Ogawa C, Sato Y, Suzuki C et al. Treatment with silver nitrate versus topical steroid treatment for umbilical granuloma, A non-inferiority randomized control trial. PLoS One. 2018;1–10.
12. Assi NA, Kadem KM, Alrubaee JR, et al. Management of umbilical granuloma. Thi-Qar Med J. 2010;4(4):82–87.
13. Lotan G, Klin B, Efrati Y. Double-ligature: A treatment for pedunculated umbilical granulomas in children. Am Fam Physician. 2002;65 (10):2067–2068.
14. Brødsgaard A, Nielsen T, Mølgaard U et al. Treating umbilical granuloma with topical clobetasol propionate cream at home is as effective as treating it with topical silver nitrate in the clinic. John Wiley Sons Ltd. 2015;104:174–177.
15. Abdullah O. Outcomes of local excision of the umbilical granuloma prior to silver nitrate cauterization. J Klagenfurt Austria. 2019;26 (4):35–41.
16. Sanober B, Rachita S. A pinch of salt is all it takes! - The novel use of table salt for the effective treatment of pyogenic granuloma. J Am AcadDermatol. 2019;1–7.
17. Bedfordshire and Luton Joint Prescribing Committee. Community health services bedfordshire, household salt for treatment of umbilical granuloma. Bedfordshire Health Commun Services. 2017;1–9.
18. Derakhshan MR. Curative effect of common salt on umbilical granuloma. Iran J Med Sci . 1988;23(3&4):132-133.
19. Kesaree N, Babu PS, Banapumath CR, Krishramurity SN. Umbilical granuloma. Indian Pediatr. 1983;20:690–692.
20. Karagüzel G. Umbilical Granuloma: Modern Understanding of Etiopathogenesis, Diagnosis and Management. J Pediatr Neonatal Care. 2016;4(3):00136.
21. Hossian AZ, Hasan GZ, Islam KD. Therapeutic Effect of Common Salt (Table/Cooking Salt) on Umbilical Granuloma in Infants. Bangladesh J Child Health. 2010;34(3):99-102.
22. Bagadia J, Jaiswal S, Bhalala KB, Poojary S. Pinch of salt: A modified technique to treat umbilical granuloma. PediatrDermatol. 2019;36(4):561-563.
23. Sözen S, Kanat BH, Kanat Z, Bali I, Polat Y. Effective conservative treatment of umbilical pilonidal sinus disease: Silver nitrate? Salt? Ann Ital Chir. 2015;86:450-455.
24. Fanos V. 10 P Pediatrics: notes for the future. J PediatrNeonat Individual Med. 2016;5(1):e050101.
25. AL-Youzbaki DB, Hachim N, AL-Jawadi AA. Popular health beliefs: Old wives tales about pregnancy and its outcome in Mosul city. Ann College Med. 2007;33(1&2):42-50.
26. Sheth SS, Malpani A. The management of umbilical granulomas with cryocautery. Am J Dis Child 1990;144(2):146–147.
27. Bristol NHS Trust. Care of the Umbilical Granuloma. Clinical guidelines. 2005.
28. Halder AL, Akter S, Shahin MP, Baki MA, Khan S, Nahar J, Molla MA. Efficacy of table salt as a treatment option for umbilical granuloma in infants. American Journal of Multidisciplinary Research & Development. 2020;2(8):39-43.