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Efficacy of Table Salt as a Treatment Option for Umbilical Granuloma in Infants

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ABSTRACT
Background: Umblical granuloma is an overgrown tissue that develops in some babies during the healing process of the umbilicus and typically remains in the umbilicus after cord separation. It is the most frequent disorder originating from umbilicus in infants. Most of umbilical granulomas can be easily diagnosed with a careful medical history and physical examination. It requires no further investigation. If remains untreated, it could ooze and present with persisting irritation for several months. Still now chemical cauterization with silver nitrate or copper sulphate are the main choices of treatment. Desiccant effect and other biological properties of sodium ion of common salt may results in shrinkage and necrosis of the wet granulomatous tissues of umblical granuloma.
Objective: To evaluate the therapeutic effect of table salt on umbilical granuloma in infants.
Materials and Methods: This prospective study was conducted on 226 infants with umbilical granuloma. Parents of these 226 infants were instructed on the treatment regimen and administration to the infant at their home. The treatment consisted of application of common salt on the lesion twice a day, washing 30 min later, and repeating the procedure for 3 days.
Result: Among 218 infants 211 (97%) infants showed complete resolution after the 3-day course of common salt treatment. Seven patients (3%) did not respond, 4 of those ultimately diagnosed as umbilical polyp and need surgical excision.
Conclusion: Salt treatment is safe and virtually inexpensive. It is a simple procedure and can be easily done even by parents. It is highly effective treatment without any complications or relapse.

KEY WORDS: Umbilical granuloma, common salt, infants

I. INTRODUCTION

Umbilical granuloma is a benign abnormality of 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 umbilicus in newborns.[4,5] In one study, prevalence of the umbilical granuloma was reported to be 1 in 500 newborns.[2] Although the exact cause of umbilical granuloma is not known, formation of the granuloma can be related to both an inflammatory process and a delay in the umbilical cord separation.[6] A similar explanation which shows close relation with the delayed cord separation is the presence of an ongoing subclinical/mild infection in the umbilical stump.[5,7] According to this hypothesis, inflammation results in both overgrowth of endothelial cells and inadequate epithelization.

Umbilical granuloma is often noted by the parents because of continuous drainage or moisture involving the umbilicus, after the cord has dried and separated. A small amount of pinkish/yellowish discharge which is often odorless was found and should not have any intestinal lumen content or urine.[4] Umbilical granulomas are seen as a small (1 to 10mm in size), soft/friable, nontender, and pale pink/red colored lesions at base of the umbilicus.

Figure: 1. Umblical granuloma; A pale-pink mass at the base of the umbilicus.

The surrounding skin is normal. Because the granuloma does not contain nerve fibers, it does not cause pain and irritability unless complicated by infection.[2,4]

Most of umbilical granulomas can easily be diagnosed with a careful medical history and physical examination. Although this condition frequently requires no further investigation, in some circumstances, use of additional diagnostic methods may be necessary.[6,8] Umbilical polyps which are covered with real epithelium poses a diagnostic challenge from clinical point of view.

Figure 2: A neonate with umblical polyp, mass appearing more bright and red fleshy mass.

Polyps are remnants of intestinal, gastric or bladder mucosa appearing more bright and red colored. Because polyps and granulomas have similar symptoms and findings, clinical ground may not be distinctive. Omphalitis, benign soft tissue tumors (dermoid cyst, hamartoma, hemangioma, etc.), vitelline duct anomalies, and urachal remnants should be considered in differential diagnosis.[8,9]

The umbilical cord normally separates within 7–10 days postpartum. Following cord separation, incomplete epithelialization may happen over the fibromuscular ring of the umbilicus. This normal granulation

tissue of the resolving umbilical stump of a newborn should vanish by the second or third week of birth with correct hygiene. Persistence of the granuloma beyond this time will require therapeutic intervention.[4,10,11,12]
The issue of what is the best treatment option is still controversial. There are many treatment modalities used for umbilical granuloma. Chemical cauterization with siver nitrate and copper sulphate are widely practiced. Although silver nitrate application is the most common one among the actual treatment options, other therapeutic methods are also available. These include common salt application, topical antiseptics/antibiotics/steroids, ligation, excision, electrocautery, and cryotherapy. More or less all treatment modalities are good enough to show a curative effect. [13] But each method has certain advantages and disadvantages. Cauterization with silver nitrate may cause a minor chemical burn on the periumbilical skin, which is painful;[14] cryocautery is expensive and complex; electrocautery is associated with a foul discharge and higher failure rates;[15] and surgical removal needs general anesthesia and is rarely required.[6] So any other agent that can minimize all these drawbacks and has a curative effect of umblical granuloma is needed. The reasons for seeking these alternatives are I) some unresponsive cases to silver nitrate application, II) the necessity of a medical professionals for its application, and III) risk of periumbilical burn with chemical cauterization.[5] Use of common salt is studied in different part of the world with good result.[5,16,17,18] It is potent and cost-effective, shows no adverse effects, and easily available. This procedure is painless and non-invasive for the baby and does not require frequent medical visits at the home or hospital. A study done by Hossain AZ et al. and Saleh ASA with common salt has excellent result also.[5,19]

The principle of using this approach is thought to be its desiccant effect and other biological properties; sodium ion in the area draws water out of the cells and results in shrinkage and necrosis of the wet granulomatous tissues. However, this effect is not so powerful as to cause damage to the normal surrounding tissue when applied for short treatment duration.[17,18,19]

II. MATERIALS AND METHODS

This prospective study was conducted at the outpatient department of paediatrics of BIRDEM General Hospital, Dhaka. Data were collected between August 2015 and June 2019. A total of 226 infants (3–15 weeks), with clinically evident umbilical granuloma attending at the Pediatric OPD were included as the target group. All infants with signs of infection at the umbilicus were excluded from the study.

The parents (mostly mothers) and other caregivers were asked to
1. Expose the centre of the umbilicus by pressing gently on the area around the umbilicus.
2. Apply a very small pinch of table/cooking salt over the umbilical granuloma.
3. Cover the area with a clean piece of gauze and secure it in place for 30 minutes.
4. It is important not to use too much salt because it will damage the normal skin around the umbilicus.
5. Clean the site using a clean gauze swab soaked in warm water.
6. Repeat the procedure twice a day for at least 3 days.

All infants were re-evaluated after 1 week and 3 weeks to see the effect of common salt on umbilical granuloma. The effects were graded as (a) excellent response (complete regression, no discharge, and healed with complete epithelialization) and (b) no response (no regression of umbilical granuloma, and persistent umbilical discharge).

III. RESULT

A total of 226 infants were included in the study. The enrolled infants were aged 3–15 weeks. Sixty five percent infants with umbilical granulomas came within 7 weeks of age (Table 1). Slight female predominance was found. One-Twenty-nine infants were girls (57%) and 97 (43%) were boys (Table 2). Eight patient lost in follow-up. The effects of common salt were evaluated 1 week and 3 weeks following the last application. Among 218 infants 211 (97%) infants demonstrated excellent results. Seven patients (3%) were not responsive, 4 of those ultimately diagnosed as umbilical polyp and need surgical excision. Two patient were alternatively treated with Silver nitrate and one with copper sulphate and were cured. No adverse effects of common salt were observed in this study. The most common observation described by parents was discharge of a reddish black secretion from the lesion on the first 2 days of treatment, following which shrinkage and gradual healing of the lesion was apparent within first 1-2 weeks of treatment.

IV. DISCUSSION

Umbilical granuloma is a minor condition with no recognized associated anomalies and is effectively and easily managed by local application of common salt. In this study a total of 226 infants were selected and treated with common salt following a standard guideline available. Their ages ranged from 3 weeks to 15 weeks. In order to collect these infants, this study was carried over 4 year's duration. Slight predominance of female sex

of infants was observed in the study, but other study showed the incidence of umbilical granuloma was the same in boys and girls. [15, 17] In this study 97% patients were cured. In other study it was even 100%. [16,19.] In a prospective study, Hossain et al. found that table salt application resulted in excellent outcome in 91.7% of their patients. Despite silver nitrate treatment group achieved good results, the authors did not recommended it because of small burns and pain at the umbilicus in some patients.[5]

However, other umbilical conditions such as umblical polyp may present in a similar manner and be difficult to distinguish clinically. There may have local umblical infection also and may have been associated with more severe anomalies and will not be cured with common salt. In our study 4 infants were ultimately diagnosed as umblical polyp and need surgical excision. Therefore, logical assessing of the discharge and swelling of the umbilicus is important in order to minimize diagnostic errors and delays in the initiation of the correct treatment. It should be kept in mind that, both poor hygienic condition and delay in medical care may result in severe local infection (omphalitis) or sepsis. The umbilical granuloma treated with common salt usually clears within 3–5 days. If not completely cured within this time, surgical advice should be obtained.

Table 1: Age group distribution (*n* = 226)

Age group (weeks)	Number of infants	Percentage (%)
3–7	146	65
9–12	51	22
13–15	29	13

Table 2: Sex distribution (*n* =226)

Sex	Number of infants	Percentage (%)
Male	97	43
Female	129	57

Table 3: Response to the treatment (*n* = 218)

Response	Number of infants	Percentage (%)
Excellent	211	97
No response	7	3

V. CONCLUSION

Salt treatment is safe and virtually inexpensive. It is a simple procedure and can be easily done even by parents. It is highly effective treatment without any complications or relapse. But logical assessment to exclude alternative diagnosis, specially umblical polyp should keep in mind.

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):82–7.

[4]. Rennie JM. Examination of the newborn. In: Rennie JM, editor. Rennie&Roberton's Textbook of Neonatology. 5th edition. India: Churchill Livingstone Elsevier;2012. p. 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 Health2010; 34(3): 99-102.

[6]. Pomeranz A. Anomalies, abnormalities, and care of the umbilicus. PediatrClin North Am2004; 51(3): 819-827.

[7]. Stoll BJ, Kliegman RM. The Umbilicus. In: Behrman RE, Kliegman RM, Jenson HB. Nelson Textbook of Pediatrics.20th edition.USA. Saunders.2016. p.890-891.

[8]. Hutson JM, Beasley SW. The Umbilicus. In: Hutson JM & Beasley SW,editors. The Surgical Examination of Children. 2nd edition. Berlin: Springer-Verlag. 2014. Ch 6, p. 75-82.

[9]. Snyder CL. Current management of umbilical abnormalities and related anomalies. SeminPediatrSurg 2007; 16(1): 41-49.

[10]. Marzban A. Curative Effect of Common Salt on Umbilical Granuloma. Journal of Medical Council of Islamic Republic of Iran 2008; 26(3): 132-3.

[11]. Vicente H (Ed). Pediatric Surgery Update 2004;22(3):65–6.6.

[12]. Faranoush M, Ghorbani R, Malek M, Amin Beidokhti, M, Yazdiha M: A comparative study on therapeutic effect of sodium chloride and alcohol in infants with umbilical granulomas.The Journal of Qazvin Univ of Med Sci 2006; 10(2).
[13]. Karagüzel G, Aldemir H (2016) Umbilical Granuloma: Modern Understanding of Etiopathogenesis, Diagnosis, and Management. J Pediatr Neonatal Care 2016; 4(3): 130-6.
[14]. Chamberlain JM, Gorman RL, Young GM. Silver nitrate burns following treatment for umbilical granuloma. Pediatr Emerg Care1992;8(1):29–30.
[15]. Sheth SS, Malpani A. The management of umbilical granulomas with cryocautery. Am J Dis Child 1990;144(2):146–7.
[16]. Kesaree N, Babu PS, Banapumath CR, Krishramurity SN.Umbilical granuloma. Indian Pediatr 1983;20:690–2.
[17]. Bristol NHS Trust. *Care of the Umbilical Granuloma. ClinicalGuidelines*. December 2005.
[18]. Derakhsan MR. Curative effect of common salt on umbilicalgranuloma. Ira J Med Science 1998;23:132–3.
[19]. Saleh ASA. Therapeutic effect of common salt on umbilical granuloma in infants. Int J Med Sci Public Health 2016;5:911-914.