Original Article

Is Application of Salt for 3 Days Locally is Sufficient to Treat Umbilical Granuloma?

Anita Singh[1], Kirti Naranje[1], Aakash Pandita[1], Vijai D. Upadhyaya[2], Basant Kumar[2], Ashish Datta Upadhyaya[3]

[1]Department of Neonatology and [2]Department of Pediatric Surgery, Sanjay Gandhi Post Graduate Institute of Medical Sciences, (SGPGIMS), [3]Department of Biostatistics, AIIMS, New Delhi

Abstract

Background: The falling of Umbilical stump occurs by 7-15 days of age. The healing of umbilical stump may be complicated by Umbilical Granuloma. It is often treated by chemical cauterisation which require repeated applications and may lead to local or systemic complications. Common salt by way of its dessicative property may help in treatment of Umbilical Granuloma. **Objective:** The objective of the study is to assess the role of common salt application in umbilical granuloma. **Materials and Methods:** This is retrospective study over 3 years from a pediatric surgery unit in Northern India. The study subjects were infants less than 10 weeks of age who presented with umbilical granuloma. The method of salt application was 1 pinch of common salt for 1 hour twice a day for 3 consecutive days. The babies were assessed at day 5th for resolution. The success was defined as thrice resolution after 3 cycles. The baseline demographic details were taken and the association of success of treatment was analyzed. **Results:** A total of 36 infants were given treatment in form of common salt application for treatment of umbilical granuloma. The success of around 96% and the cases which presented early responded well. Most of the cases resolved after 3 cycles of treatment. **Conclusion:** The common salt application is effective in treatment of granuloma without any side effects.

Keywords: Chemical cauterisation, persistent discharge, umbilical polyp

Introduction

Umbilical stump separates by 7–15 days postpartum.[1] Umbilical ring is closed by epithelisation after the stump falls from the umbilicus.[2] In few infants, the umbilical ring is not closed properly and develop small velvety, pink to bright red coloured outgrowth at the umbilicus called as umbilical granuloma (UG). It needs attention because of serous discharge and if not treated may lead to infection or mild oozing of blood.[3] Umbilical granuloma is not a congenital abnormality, but it represents granulation tissue which is not properly epithelialised. Histologically, it is composed of fibroblasts and capillaries with no nerves.[1] The spontaneous resolution of umbilical granuloma is not known, hence the early and proper treatment is necessary to avoid potential infective complications.[3] Umbilical Granuloma (UG) can be treated by various modalities and most common modality is chemical cauterisation. The drugs used for chemical cauterisation are silver nitrate sticks,[4,5] copper sulphate granules,[6,7] ethanol wipes,[8] doxycycline,[9] clobetasol propionate[10,11] and more recently, common salt is used for chemical cauterisation. All chemical agents used for the treatment of UG have shown complete resolution by different authors though each chemical has its own merits and demerits.

Major drawback of chemical cauterisation is need of repeated applications and local side effect. Silver nitrate sticks and copper sulphate granules may lead to burning of local skin if not applied properly and require expertise for proper application to get the desired result, hence require a frequent visit to the hospital. Clobetasol propionate does not require any expertise for application and can be safely applied by parents at home. Disadvantage of clobestsol propionate is a long time frame of treatment which is usually of 30 days and being a steroid, it has a potential risk of local and systemic

Address for correspondence: Dr. Vijai D. Upadhyaya, Additional Professor, Department of Pediatric Surgery, Sanjay Gandhi Postgradaute Institute of Medical Sciences, Lucknow, Uttar Pradesh, India.
E-mail: upadhyayavj@rediffmail.com

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side effect[11] Ethanol wipes and doxycycline are comparatively safe and can be used by parents at home, but their results were not convincing, hence not widely used.

In search of safer and effective management of umbilical granuloma, common salt was used by few researchers[12,13] based on its desiccative property. Application of salt leads to a higher concentration of sodium ion around UG and draws water out of it, resulting in shrinkage of the granulation tissue. This study was carried out to know the effect of salt on UG and duration of salt (rock salt) treatment to achieve the optimal result.

Materials and Methods

This was a retrospective study performed at paediatric surgery outpatient clinic, tertiary centre in North India, from January 2015 to December 2018.

As per the record, a total of 40 infants of UG presented to the paediatric surgery outpatient department, of which only 36 were managed with salt application. Four patients already received some treatment from the general practitioner, hence were not included in the study.

As per the record, the procedure followed for salt application was (i) lesion cleaned with lukewarm water soaked cotton ball [Figure 1], (ii) pinch of rock salt sprinkled over lesion and removed after 1 h and (iii) procedure properly taught and explained to parent of the infant to repeat at home twice daily for 3 days and review on 5th day. This is one complete session of salt application. At the first review that is on 5th day if UG resolved, it was considered as cured and the patient was reviewed after 1 month. If UG was not resolved at the first visit, parents are advised to repeat the same procedure. As per the record, application of salt twice daily for 1 h for 3 consecutive days was considered as one complete cycle.

As per the records, the patients were levelled nonresponsive if they do not respond to four cycles of salt application and were managed with suture ligation technique. All patients were followed for 12 weeks.

a. Cured: If granuloma was separated completely displaying normal skin cover and without any serous discharge,
b. Nonresponsive: No change in the nature of the disease

The following parameters were retrieved from the record at each visit: (1) change in colour of lesion, (2) change in size of the lesion, (3) soakage if any from the lesion, (4) excessive crying during salt application and (7) any skin change. Parents did not report any behavioural changes, sleep disturbances or irritability in the infants after the application (though the first application is done by the treating clinician itself.)

Statistical analysis

Data were entered into Excel and scrutinised for error. Further, categorical variables were expressed in frequency and percentage. Association of categorical variable was assessed by Chi-square/Fisher's exact test. $P < 0.05$ was considered as statistically significant and analysed by Stata 14 (StataCorp, College Station, Texas, USA).

Results

A total of 36 patients with umbilical granuloma aged between 4 weeks and 20 weeks (except one) were managed during July 2018–December 2019 [Table 1]: In 6 cases, granuloma separated after one complete session of salt application, whereas in 11 cases, it took two complete sessions for the resolution of UG. In most cases, UG was resolved with three cycles of salt application. Two infants required four

Figure 1: Showing the effect of slat application

Table 1: Demographic profile of study infants. *n*=36

Age in weeks at the time of presentation (weeks)	Male, f (%)	Female, f (%)	*P*
4- 10	12 (60)	8 (40)	0.821
>10	9 (56.2)	7 (43.8)	

Chi-square test applied

Table 2: Response in study infants in different age groups. *n*=36

Age at presentation (weeks)	Complete response in one cycle, f (%)	Complete response in two cycles, f (%)	Complete response in three cycles, f (%)	Complete response in four cycles, f (%)	No complete response (failed treatment), f (%)	*P*
4- 10 *n*=20	5 (25)	9 (45)	5 (25.0)	0 (0.0)	1 (5.0)*	0.018
>10 *n*=16	1 (6.2)	2 (12.5)	10 (62.5)	2 (12.5)	1 (6.3)#	

Fisher's exact test applied. *Patient lost to follow-up after second cycle and considered as non-responder, #Patient was 18 month old, not responded to the cauterisation with salt and managed with suture ligation

complete sessions for the resolution of UG [Table 2]. The cases presented early required relatively less number of salt applications than who presented late and this difference was found out to be statistically significant. One case lost to follow-up after second session of salt application, whereas one case not responded to salt application and managed with suture ligation. None of patients had a local complication in terms of skin colour change, skin maceration or excessive cry during salt application. No parent complained for any difficulty or irritability of their infant while applying salt. All parents completed the treatment without difficulty and had satisfactory result except in two cases, one of which lost to follow-up and another which was termed as nonresponder and latter treated by suture ligation technique.

Discussion

UG is relatively a common condition with no recognised associated anomalies. Chemical cauterisation is the most common method to treat UG. Few other umbilical conditions may present in a similar manner which are difficult to distinguish from UG like patent urachus and patent vitello-intestinal duct and should not be treated with chemical cauterisation. Therefore adequate assessment of the discharge and swelling of the umbilicus should be done to minimise diagnostic errors and delay in proper management.

Application of common salt for treating umbilical granuloma has been tried in the past and used at some centres in India[13,14] for the management of UG. A review of the English literature revealed the following steps for salt application: (i) cleaning of the umbilical area with a wet cotton pad, (ii) pinch of salt crystals is sprinkled on the granuloma, (iii) granuloma is closed with an adhesive drape, (iv) drape is opened 30 min after the procedure and the application procedure is terminated and (v) this process was repeated two times a day for 3 days and the patient was reviewed on the 6th day.[15]

The procedure of salt application was modification which was done by either increasing the days of application or increase the time of contact of salt to the granuloma for better results. It ranged from single application where salt remained for 24 h[16] to 12 application of salt over 7 consecutive days where salt was removed after 1 h of each application.[14] Few studies adopted the covering of the granuloma site after application of salt using adhesive tape for ensuring proper contact of the salt to the granuloma,[16-18] whereas others left the site open to prevent possible sogginess around the granuloma.[14,17,19]

Most of the published series on chemical cauterisation of UG using common salt had excellent results[14,17,18] and only in few results were not convincing.[6,7] The overall efficacy of salt to treat UG ranged from 53% to 100%, as reported in different studies.[13-19] It was not clear how many days of treatment is required for optimum result; current studies used salt in a phased manner and determined the time and number of salt application for the resolution of UG.

In the present study, salt was used as the primary agent for the cauterisation of UG with slight modification of standard technique based on the fact that local and systemic side effects of salt are negligible, its application can be done by the parents easily at their home if properly demonstrated to them, duration of treatment is short and last but not the least was the low cost and easy availability of the salt. Modification of the standard procedure (vide above 16) done in the present study was (a) contact time of salt was made to 1 h instead of 30 min at each application and (b) patients were not marked as nonresponsive if UG was not resolved after application of salt for 3 consecutive days (one cycle). The patients were asked to apply at least for three more cycles of salt application before marking them as no responder. With this modification, complete resolution of UG was achieved in 96% cases and only one case who was nonresponsive to cauterisation with salt was 18 months.

Limitation(s)

It was a retrospective study and there was no comparison with any other mode of treatment. The prospective study with three or four arms would have been better because, in the present series, the same patients were subjected to the next cycle once if not resolved with one cycle till completion of the fourth cycle. The contact time of the salt to the UG was subjective because we have to rely on the parents. This retrospective observational study was carried to know the efficacy of common salt/table salt (rock salt) in the management of umbilical granuloma.

Conclusion

Umbilical granuloma can be effectively managed with common salt, and the best result is obtained if application salt is done at least for 9–12 days.

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Conflicts of interest

There are no conflicts of interest.

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