

## Therapeutic effect of table salt on umbilical granuloma in infants- North Indian experience

Rakesh Kumar Tripathi<sup>1</sup>, Pinaki Ranjan Debnath<sup>2,\*</sup>, Shalu Shah<sup>3</sup>, Divya Tripathi<sup>4</sup>, Ekta Debnath<sup>5</sup>

<sup>1</sup>Associate Professor, Dept. of Surgery, Paediatric Surgery Division of General Surgery, GSV Medical College Kanpur, Uttar Pradesh, <sup>2</sup>Associate Professor, <sup>3</sup>Assistant Professor, <sup>2,3</sup>Dept. of Paediatric Surgery, <sup>2,3</sup>PGIMER & DR RML Hospital, New Delhi, <sup>4</sup>Assistant Professor, Dept. of Obs & Gynae, GSV Medical College, Kanpur, Uttar Pradesh, <sup>5</sup>Professor, Dept. of Biochemistry, Lady Hardinge Medical College, New Delhi, India

**\*Corresponding Author:**

Email: drpinaki\_mch@yahoo.co.in

### Abstract

**Introduction:** Umbilical granuloma is one of the distressing problem to the patient's and parents due it's red fleshy look and continuous ooze of watery fluids. It is the most common umbilical problem in infant's. Normally umbilical cord separates 7-10 days after birth and umbilical cicatrix gets epithelised thereafter. It has been found that table salt/common salt has therapeutic effect in curing umbilical granuloma.

**Materials and Methods:** This prospective observational study was done at GSV medical College, Kanpur enrolling 126 infants of age 4<sup>th</sup> to 20 weeks from Jan 2010 to July 2017. After excluding other umbilical problems, all granuloma patient's mother were advised to apply common salt on it twice a day for one week. Patients were followed up on 1<sup>st</sup> and 4<sup>th</sup> week of starting treatment.

**Results:** In our study out of 126 patients 121 showed excellent result. In this group 78 were male and 43 were female infants. Overall cure rate was 96.3% which is as per international standard by other study group.

**Discussion:** It has been postulated that due to some infection the normal epithelisation of umbilical cicatrix does not happen and overgrowth of granulomatous tissue takes place. This granuloma is devoid of any nerve tissue. Spontaneous regression of this granuloma is unknown, so there are different treatment modalities evolved for this problem. The desiccant effect of common salt is the main mechanism of action of its curing property.

**Conclusion:** Treatment of umbilical granuloma with table salt is very effective, easy and safe on out patient basis. Parents can directly involve here with great satisfaction as it is cost effective too.

**Keywords:** Umbilical granuloma, Table salt, Infants, Common salt.

### Introduction

Umbilical granuloma continues to be a chronic problem to the infants and causes much distress with anxiety to the parents. Umbilical granuloma ranks itself as the most common umbilical problem in infant.<sup>1</sup> It is a red fleshy tissue overgrown at the umbilicus following cord separation and the causative factors seems to be some low grade infections.<sup>2</sup> The normal cord usually separates 7-10 days postpartum. After normal cord separation the umbilical cicatrix gets epithelialised. The remaining granulation tissue normally disappears by 3<sup>rd</sup> week of life with proper hygiene.<sup>3</sup> Due to its irritating property and continuous oozing of watery materials from it demands treatment. The spontaneous regression of this granuloma is unknown and different modalities of treatment have been instituted therefore. The therapeutic effect of common salt or table salt was first described by Schmitt in 1972.<sup>4</sup> There after several studies have been done on this issue and authors have demonstrated its efficacy in different ethnic infantile population.<sup>5-9</sup> The umbilical granuloma tissue is devoid of any nerve so the treatment is pain free.<sup>5</sup> Keeping in mind about it's efficacy without side effect and easy to apply and cost benefit we have designed this present study in North Indian infantile population. It is a prospective observational study.

### Materials and Methods

The study was done in the paediatric surgery division of surgery department of GSV Medical college, Kanpur a tertiary care center in North India from January 2010 to July 2017. In this prospective observational study, we have enrolled 126 male and female infants of 4 to 20 weeks of age with umbilical granuloma (Table ). All cases have been thoroughly examined by paediatric surgeon to exclude other common umbilical problems to include purely umbilical granuloma patients (Fig. 1). We have excluded patients with umbilical granuloma with other acute problems like pneumonia, diarrhoea for time being and those patients were included later when the acute problem settled down. After thoroughly explaining the method to all mothers, they are advised to apply a pinch of salt on granuloma twice a day for 7 days. During followup on 1<sup>st</sup> week all patients were investigated for serum sodium level and everybody has normal level, that excludes any absorption of sodium from the granulation tissue. Before and after the application parts to be cleaned with cotton balls soaked with cooled boiled water and after application adhesive tape to be applied for half an hour. All patients were followed up after 1<sup>st</sup> and 4<sup>th</sup> week of starting of treatment (Fig. 2). We have grouped our patients as A) complete response without any residue or discharge B)

incomplete response where other method of treatment needed.



**Fig. 1: Umbilical granuloma before treatment**



**Fig. 2: One week after salt treatment**

## Results

A total no of 126 infants of which 82 male and 44 females were included in this study. Out of 126 infants 121 infants showed excellent result with complete epithelisation of umbilicus (Table 2). In this group 78 male and rest were female infant. In group B 5 patients showed minimal response and all were subjected to electrocauterisation. Overall cure rate was 96.3%.

**Table 1: Age distribution**

Age		
4 - 10 weeks	52 (M)	33 (F)
11 - 15 weeks	20 (M)	8(F)
16 - 20 weeks	10(M)	3 (F)

**Table 2: Treatment response**

Total no patients responded	Male	Female
121 excellent (complete response)	78	43
Total no of patients failed		
5 (incomplete response)	4	1



**Fig. 3: Silver nitrate induced burns**

## Discussion

Umbilical granuloma is an irritating and distressing problem both to the patients and parents. Due to its red fleshy look associated with watery discharge leading to wet clothes has always draw the attention of the parents and seeks medical help. Normally umbilical cord separates by 7-10 days post partum and the belly button gets epithelialised to give an acceptable look.<sup>3</sup> It has been postulated that if there is mild infection that hampers the normal course of epithelisation and overgrowth of granulomatous tissue which is devoid of any nerve tissue. Spontaneous regression of umbilical granuloma is unknown, so some kind of treatment must be instituted. There are different treatment modalities of this condition like chemical cauterization, electrocauterisation, cryo cauterization. ligation and surgical excision.<sup>9</sup> Each and every methods have their advantages and disadvantages. chemical cauterization with silver nitrate or copper sulphate causes staining of clothes as well as skin burn<sup>10</sup> Fig. 3, electrocauterisation causes foul smelling discharge.<sup>9</sup> Cryo -cauterization is costly affair and surgical excision needs hospitalization and general anesthesia. But application of common salt is easy and cost effective, does not need any specialized care and instrument. It is as simple as that the parent's can apply it safely after simple demonstration on out-patient department basis without any fear and distress. The mechanism of action of common salt is due its desiccant property and other biological property.<sup>4</sup> The high concentration of sodium ion draws out water from wet granulation tissue leading to necrosis of the cell and the whole granuloma gets replaced by normal epithelial cells. The common salt does not have any burning property to periumbilical skin, nonirritant and it is totally painless procedure as the target tissue has no nerve.<sup>5</sup>

In the present study, out of 126 patients 122 had complete cure and 4 had failure in terms of incomplete response. We further evaluated those four cases and found out that the parents were noncompliant and did

not follow our protocol due to fear. They were treated with electro cauterisation. We also evaluated the parent satisfaction level and found out to be very satisfactory for those 122 cases as they did not have to come frequently to clinic and cost of treatment is virtually nil.

### Conclusion

From the present study it has been shown that umbilical granuloma can be treated with common salt with significantly higher cure rate. The treatment is very safe, cost effective and can be given on out-patient department basis by parents only. As there is no hospitalization and does not hamper daily routine of parents, parental satisfaction was very high.

### References

1. O'Donnell KA, Glick PL, Caty MG. Paediatric umbilical problems. *Pediatr Clin North Am* 1998;45:791-99.
2. Assi AN, Kadem MK, Management of umbilical granuloma. *Thi-Qar Medical Journal*. 2010;4 (4):82-87.
3. Wilson CB, Orch HD, Dassel's A, Ochs UH. When umbilical cord separation delayed. *J Pediatr* 1985;107:92-294.
4. Schmitt BD. Tip of the month, Shrinking umbilical granulomas. *Consultant* 1972;12:91.
5. Hossain AZ, Hasan GZ, Islam KD. Therapeutic effect of common salt (table/cooking salt) on umbilical granuloma in infants. *Bangladesh Journal of Child Health* 2010;Vol 34(3):99-102.
6. Derakhsan MR, Curative effect of common salt on umbilical granuloma. *Iranian J med Science* 1998;23:132-3.
7. AS Farhat, A Mohammadzadeh. Comparison between Two and Twenty-four Hours Salt Powder in Treatment of Infant Umbilical Granuloma. *Iranian Red Crescent Medical Journal* 2008;10(4):267-9.
8. Kesaree, N, Babu, P. S., Banapurthamath, C. R. Krishnamurthy, S. N. Umbilical Granuloma. *Indian Pediatrics* 1983;20:690-2.
9. Saleh ASA. Therapeutic effect of common salt on umbilical granuloma in infants. *International Journal of Medical Science and Public Health* 2016;Vol 5:Issue 05:911-14.
10. Chamberlain, J. M., Gorman, R. L. & Young, G. M. Silver Nitrate Burns following treatment for umbilical granuloma *Pediatric Emergency Care*. 1992;8:29-30.