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Original Article

Therapeutic Effect of Common Salt on Umbilical Granuloma in Infants: An Effective, Cheap, and Available Alternative Treatment Option

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Abstract

Background: Umbilical granuloma is a small swelling composed of granulation tissue at the base of the umbilicus. It is a relatively common problem in the neonatal period and infants, encountering after separation of the umbilical cord. Available treatment option of umbilical granuloma includes cauterization with Silver nitrate/copper Sulphate, cryo/electrocauterization, common salt, alcohol, surgical excision, and double-ligature technique.

Objectives: 1. To evaluate the therapeutic effect of common salt on umbilical granuloma in infants and follow up of cases at 1st and 3rd week of starting treatment. 2. To observe the outcome and complications.

Materials and Methods: This prospective observational study was conducted in the Department of Pediatrics, JN Institute of Medical Sciences, Imphal enrolling 34 infants of 3rd–16th weeks from January 2017 to November 2020. Patient's mother were advised to apply common salt on it twice a day, washed 30 min later, and repeated for 1 week. Patients were followed up on the 1st and 3rd week of starting treatment.

Results: In our study out of 34 cases, 33 had excellent result. The overall cure rate was 97.05% which is as per international standard by other study. No complication or recurrence was noted in in follow- up.

Conclusion: Our data showed that treatment of umbilical granuloma with table salt is simple, cost-effective, curative, safe, and can be easily apply by parents at home.

Key words: Umbilical granuloma, Common salt, Table salt, Infants

INTRODUCTION

An umbilical granuloma is the most common umbilical mass in the neonatal period. Though the exact cause is not known, this pink friable mass is thought to be formed due to excessive inflammation in the base of the umbilical cord likely due to infection which may result in delayed cord separation.[1,2] Umbilical granuloma commonly come to attention of parents because of persistent drainage or moisture involving the umbilicus after the cord has dried and separated. It is not a congenital abnormality but represents continuing inflammation of granulation tissue, that has not yet epithelialized.[3] The umbilical cord stump usually dries and separates within 1–2 weeks after birth.[2] After cord separation, there may be incomplete epithelialization over the fibromuscular ring of the umbilicus and an area of beefy red tissue or granulation tissue is visible with or without discharge may be visible. This normal granulation tissue of the resolving umbilical stump of a newborn should disappear by the 2nd or 3rd week of the life after proper hygiene. Granulation tissue can overgrowth at the umbilicus can results in an umbilical granuloma with or without discharge. It contains no nerves and has no feeling.[4] This may follow a fumigating infection with discharge.[5] Persistent of the granuloma beyond this time will need some type of therapy.[6]

At present, the therapeutic options for umbilical granuloma are 1. Chemical cauterization with silver nitrate or copper

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sulfate 2. Electric cauterization 3. Cryo cauterization 4. Surgical excision 5. Double ligature technique. The conventional method is to do chemical cauterization with 75% silver nitrate and copper sulfate. These are not innocuous and when applied liberally can cause minor burn in the periumbilical skin area.

The first report of the use of salt for the treatment of umbilical granuloma was reported by Schmitt[6] and describes the shrinking effect of common salt on umbilical granuloma and then detailed by Kasaree in 1983.[7]

MATERIALS AND METHODS

This is a prospective study conducted in the Department of Pediatrics, JNIMS Imphal between January 2017 and November 2020. A total of 34 infants (3–16 weeks) both male and female with clinically evident umbilical granuloma who sought treatment in the outpatient Department of Pediatrics were considered as the target group [Table 1]. After thoroughly explaining the procedure. The mothers were asked to apply a small pinch of table/cooking salt over the umbilical granuloma after cleaning with cotton balls soaked in cooled boiled water/normal saline and cover the area with adhesive tapes to be applied for ½ h. Thereafter, the lesion would be cleansed using cotton balls soaked in boiled water. The procedure was repeated twice a day for 1 week. All the patients were followed up after 1st and 3rd week of starting treatment to see the effect of common salt on umbilical granuloma. The response was graded as (a) complete response without any residue or discharge (b) incomplete response where other method of treatment needed.

RESULTS

A total of 34 infants with clinically diagnosed umbilical granuloma were enrolled in the study. Among the enrolled, infants were at 3–16 week of age group. The incidence of umbilical granuloma was more common between 3 and 8 weeks of age [Table 1]. Table 2 shows equal sex distribution among the study group. Response of common salt was evaluated after 1st and 3rd week of the last application. Out of 34 infants, 31 (91.17%) showed excellent results with complete epithelization of the umbilicus, and 2 (5.88%) had excellent response after 3rd week [Table 3].

No adverse effects of common salt were observed in the present study. The most common observation described by parents was frank shrinkage and gradual healing of the lesion was apparent within 3 weeks. The umbilicus returned to normal in all 33 infants. One patient in whom there was incomplete response was referred to pediatric surgeon. The overall cure rate was 97.05%.

Table 1: Age-wise distribution in the study groups (*n*=34)

Age group	Number of patients	Percentage
3–8 week	24	70.58
9–12 week	6	17.64
13–16 week	4	11.76

Table 2: Sex- wise distribution in the study groups (*n*=34)

Sex	Number of patients	Percentage
Male	17	50
Female	17	50

Table 3: Response to treatment in the study groups

Response to treatment		Number of patients	Percentage
Excellent response	End of 1st week	31	91.17
	End of 3rd week	2	5.88
Incomplete response		1	2.94

DISCUSSION

An umbilical granuloma is a common umbilical abnormality of neonates and infants which develops in a umbilical stump after the cord falls off. Umbilical granuloma developin about 1outof 500 births.[8] Umbilical swelling and discharge are common in pediatric practice and may challenge the doctor's diagnostic acumen. If umbilical granuloma remains untreated it could ooze and become an irritation for several months.[9] There are many treatment modalities of umbilical granuloma such as chemical cauterization, electrocauterization, cryo cauterization, and surgical excision. Although all modalities of treatment had curative effect each method have advantages and disadvantages.[10] Cauterization with silver nitrate and copper sulfate may cause minor burn of periumbilical skin area which is painful,[10] cryo cautery is expensive and complex, foul discharge and failure rates were higher with electro cautery[11] and surgical removal need general anesthesia and rarely required.[3] The natural regression of the untreated umbilical granuloma has not being documented.[6] It has been reported that it may lead to serious and life-threatening complications, such as omphalitis, sepsis, or necrotizing fasciitis when it is left untreated.[12] In population with limited access to medical care and resource-poor setting, in order to prevent mortality and morbidity, it is very important to be treated with a reliable, easily accessible, and cheap agent by families at home. Hence, there is a research for an agent which is without any complication and has a curative effect. In this situation common salt (table/cooking) is a suitable agent for the treatment of umbilical granuloma. Common salt is

potent, has no side effect, cost-effective and easily available. Encourage with the experience of others[13-15] we have also used common salt (Table salt) on our study population.

A total of 34 infants were selected in our study. Their ages ranged from 3 weeks to 16 weeks. In the literature, the incidence of umbilical granuloma is same in both males and females [7] which is also same in our study.

In the present study, 33 infants (97.05%) had complete cure without any complications or recurrence was noted in the follow-up and 1 had incomplete response due to non -compliance of treatment by parents or caretakers.

Umbilical granuloma is a minor condition with no recognized associated anomalies and is effectively and easily managed by local application of table salt. They may have important associated anomalies and will not be cured with common salt. Therefore, it is important to have a logical approach to discharge and swelling of the umbilicus in order to minimize diagnostic errors and delays in the initiation of the correct treatment. The umbilical granuloma treated with common salt usually clears within 3 weeks. If not completely cured within this time surgical advice should be obtained.[7] In our study, topical salt had a high response rate (97.05%) without recurrence.

The curative mechanism of common salt is due to its desiccant effect and other biologic properties.[7] The high concentration of sodium ions in the area draws water out of the cells and results in shrinkage and necrosis of the wet granulation tissue and the whole granuloma gets replaced by normal epithelial cells.[7] However, this effect is not so powerful as to cause damage to normal surrounding cornified tissue when applied for treatment duration and it is a painless procedure as the target tissue has no nerve.[14]

In a study conducted by Badebrarin *et al*.,[16] Saleh *et al*.,[17] and Marzban *et al*.,[18] reported 96–100% recovery rate after treatment with table salt for a period of 5 days.

Unlike conventional treatment with 75% Silver nitrate, which may cause periumbilical skin burns and cloth staining and need several applications and should be treated by physician,[14] common salt does not have such complications and can be treated by parents.

In our study, we found that umbilical granuloma is curable with table salt. Furthermore, we did not observe any local or systemic adverse effects and relapse after the application of common salt. With the above findings, our study highlights successful treatment of umbilical granuloma with common salt.

CONCLUSION

We can conclude that complete resolution of umbilical granuloma can be achieved by application of table salt with significant high cure rate. It is a simple highly effective and inexpensive form of treatment without the risk of any relapse and complications or side effects. For many populations with limited access to medical care, table salt may be the first choice in the treatment of umbilical granuloma. Because of easy to access, treatment can be performed by nonhealth professionals.

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