

The Value of Copper Sulphate in Umbilical Granuloma a Prospective Study

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Abstract

Original Research Article

Background: Umbilical granuloma is one of the commonest presentations in the pediatric surgery outdoor. Persistent drainage or moisture involving the umbilicus is chief complaint. If umbilical granuloma remains untreated, it could ooze and present with persisting irritation for several months. The main concern has been over avoidance of surgery in infants with umbilical granuloma. Different protocols have been proposed from time to time. **Objective:** To evaluate the therapeutic effect of copper sulphate on umbilical granuloma in infants. **Materials and Methods:** This prospective study was conducted on 25 infants with umbilical granuloma. In all patients Copper sulphate applied once over the Umbilical granuloma for 5 minutes. A sterile gauze and adhesive bandage were applied after cleaning of copper sulphate application. Treatments were administered in outpatient settings, and the patients were followed up at 1 week, and 2 weeks interval to record the outcome. **Result:** All 25 cases responded well to this approach with complete resolution of lesions. No major complication or recurrence was noted in follow-up. **Conclusion:** The use of copper sulphate in treating umbilical granuloma is simple, cost-effective, curative, and safe.

Key words: Umbilical granuloma, Copper sulphate, infants.

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INTRODUCTION

Umbilical granuloma has always been a matter of parental concern and constitutes a common reason to attend the pediatric surgery outdoor [1, 2]. Umbilical granuloma is a benign abnormality of the neonates occur as a result of too much granulation tissue after separation of cord from the umbilicus [1]. It also occurs as a reaction to a mild infection [3]. Following the infection or cord separation, a tiny portion of a slightly wet, bright red, flesh remains in the umbilical cord. Failure of epithelialization of this left-over granulation tissue leads to the formation of umbilical granuloma [4]. If not treated on time it may lead to infection, oozing, discharge, and irritation [4]. A number of different modalities available for the treatment of umbilical granuloma such as cauterization with silver nitrate (most commonly used), common salt, electrocauterization, cryotherapy, alcohol, and ligation of the granuloma. Each of these methods has its merits and demerits, and some may have significant side effects, such as reports of skin burns following the use of silver nitrate [3].

MATERIALS AND METHODS

This prospective study was conducted on 25 patients attending the pediatric surgery outdoor of SMS

medical college Jaipur, Rajasthan, India from September 2017 to April 2018 with a diagnosis of umbilical granuloma. In all patients Copper sulphate applied once over the Umbilical granuloma for 5-10 minutes. A sterile gauze and adhesive bandage were applied after cleaning of copper sulphate application. Treatments were administered in outpatient settings, and the patients were followed up at 1 week, 2 weeks, and 1-month interval to record the outcome. Complete regression, complete epithelialization, and no discharge interpreted excellent response while partial regression/epithelialization and no regression represented no response.

RESULT

All the patients were similar in terms of socioeconomic and ethnic profile. A total of 25 infants of aged 2-16 week were included in the study [Table 1].

Table-1: Distribution of patients according to Age

| Age range (in week) of patients | No. of patients (%) |
|---------------------------------|---------------------|
| 2-8 | 13 (52%) |
| 9-12 | 10 (40%) |
| 13-16 | 2 (8%) |

Table-2: Sex distribution

| Sex | Number Of Infants |
|--------|-------------------|
| Male | 14 |
| Female | 11 |

Fourteen infants were boys and eleven were girls [Table 2]. The effect of copper sulphate was evaluated 1 week, 2 weeks and 1 month following the last application. In 21 (84%) patients complete epithelialization occur in 5-7 days and 3 (12%) patients responded in 8-10 days. In one patient need second visit for copper sulphate application. All 25 (100%) infants demonstrated excellent results [Table 3].

**Table-3: Response to the treatment (n = 25)
Percentage**

| Response in Days | Number Of Patients (%) |
|------------------|------------------------|
| 5-7 Days | 21 (84%) |
| 8-10 Day | 3 (12%) |
| >10 days | 1 (4 %) |

No adverse effects of copper sulphate were observed in this study. The umbilicus returned to normal and no recurrence occurs in all 25 infants.

DISCUSSION

Umbilical granuloma is relatively very common surgical entity in infants at our center. Umbilical Granuloma develops due to failed epithelialization and increase growth of granulation tissue at the umbilicus after separation of umbilical cord [1, 4]. It may become complicated and led to the formation of pus for several months if left untreated, or not treated properly [5]. In the literature, natural regression of the untreated umbilical granuloma has been not documented, so treatment is necessary [6]. Different approaches have been suggested in literature such as chemical cauterization, electrical cauterization, cryo- cauterization, and treatment with topical copper sulfate, and common salt [7]. Small granulomas can be treated with silver nitrate remedy while larger ones may require surgical resection [8]. Chemical cauterization, with 75% silver nitrate was the most commonly used treatment [9]. Use of silver nitrate in umbilical granuloma has been drastically cut down due to its propensity to cause burns if not well administered [3]. Currently, electric cauterization or surgery is an option in failed noninvasive treatments. These treatments are surgical removal of the granuloma under general anesthesia. A disadvantage is that it costs more than noninvasive treatments. Copper sulphate is a suitable agent for the treatment of umbilical granuloma in this situation. It is potent and cost-effective, shows no adverse effects, and easily available. In our study, copper sulphate had a high response rate (100%) without any recurrence.

In our study, the majority of the patients with umbilical granuloma were under the age of 8 weeks. This is consistent with the study of Anapurna *et al.* they reported the prevalent age group is less than two months in 82.14% [9]. A study by Saleh A *et al.* also reported that the prevalent age group is less than two months is 72.0% [10].

Present study has attempted to simplify the approach towards umbilical granuloma. It is to be emphasized that no surgery should be advised in these young patients. Proper counseling of the parenteral anxiety is important. In our study, copper sulphate, had a high response rate (100%) without recurrence. This finding is consistent with the observations of Anapurna *et al.* who found an excellent response with copper sulfate group (95.5%) and slightly better response to the common salt group (55%) [9]. they suggest that copper sulfate may be a more efficacious form of therapy than the common salt.

CONCLUSION

Our results showed that Copper sulphate is a reasonable method for Umbilical granuloma, resulting in good cosmetic appearance and acceptable complication rates. However, further randomized controlled study on large number of patients with longer follow up period is recommended to prove the therapeutic effect of copper sulphate in management of umbilical granuloma and in minimizing the need for surgery and recurrence.

REFERENCES

1. Pomeranz, A. (2004). Anomalies, abnormalities, and care of the umbilicus. *Pediatric Clinics*, 51(3), 819-827.
2. Assi, A. N., Kadem, M. K., Al Rubaee, R. J., & Atshan, F. G. (2010). Management of umbilical granuloma. *Thi-Qar Medical Journal (TQMJ)*, 4(4), 82-87.
3. Fiaz, M., Bhatti, A. B., Ahmed, N., & Ahmed, R. R. (2017). A comparative study of the therapeutic effects of copper sulfate versus common salt (sodium chloride) in the treatment of infantile umbilical granuloma. *Jmscr*, 5, 31127-32.
4. Sharma, C. M., Aggarwal, B., & Chaudhary, P. (2020). Role of common salt in the treatment of umbilical cord granuloma.
5. Campbell, J., Beasley, S. W., McMullin, N., & Hutson, J. M. (1986). Clinical diagnosis of umbilical swellings and discharges in children. *Medical journal of Australia*, 145(9), 450-453.
6. Hossain, A. Z., Hasan, G. Z., & Islam, K. D. (2010). Therapeutic effect of common salt (table/cooking salt) on umbilical granuloma in infants. *Bangladesh Journal of Child Health*, 34(3), 99-102.

7. Farhat, A., & Mohammadzadeh, A. (2008). Comparison between two and twenty-four hours salt powder in treatment of infant umbilical granuloma.
8. Vicente, H. (2004). Pediatric Surgery Update, 22(3); 65-66.
9. Annapurna, D., & Ramu, P. (2015). Therapeutic effect of copper sulphate vs common salt (table/cooking salt) on umbilical granuloma in infants: a comparative study. *Journal of Evolution of Medical and Dental Sciences*, 4(10), 1616-1622.
10. Al Saleh, A. S. (2016). Therapeutic effect of common salt on umbilical granuloma in infants. *International Journal of Medical Science and Public Health*, 5(05), 911.