

# The effect of table salt as a treatment of umbilical granuloma in neonates

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## Abstract

**Introduction:** Umbilical granuloma is a widespread problem that may cause anguish to the parents.

**Patients and method:** A randomized controlled study was conducted on 85 neonates aged 2-4 weeks (42 males and 43 females) with a diagnosis of umbilical granuloma. They were randomly divided into 2 groups; group A included 42 patients (20 males and 22 females), and group B included 43 patients (21 males and 22 females). Parents of group A patients were instructed to use a small amount of common salt on the granuloma after cleaning it, and to cover the salt by blaster for 30 minutes to keep it in place; after that, the blaster had to be removed, and the umbilicus was cleaned with sterile cotton and water to remove the salt. The procedure was repeated for 3 days straight. Group B was treated once by applying clean dry silver nitrate sticks (concentration of 20%) on the granuloma; contact with normal skin was avoided. The procedure was performed by the researcher himself at his clinic. Statistical analysis was done by using Fisher Exact test.

**Results:** In group A, 39 (92.9%) responded to treatment by salt, while 3 (7.1%) of them did not respond. In group B, 41 (95.3%) responded to treatment by silver nitrate, while 2 (4.7%) did not respond. There was no significant difference between the two groups, with  $p$ -value = 0.676.

**Conclusion:** Umbilical granuloma can be treated with topical application of common salt; such a method can be considered a valid alternative for its effectiveness, safety, and simplicity.

## Keywords

Umbilical granuloma, common salt, silver nitrate, neonates.

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## Introduction

Umbilical granuloma is one of the common conditions during the neonatal period that can cause suffering for parents [1]. It is an overgrowth of granulation tissue that appears as a friable wet red pedunculated mass after the separation of the umbilical cord. Its size can vary from 3 to 10 mm, and some studies have recognized it as a mild local infection [2]. Umbilical granuloma forms at the base of the umbilicus from an access of the tissue that persists at the bottom following the separation of the umbilical cord in the first few weeks of life [3].

The umbilical cord is usually separated 7-10 days after birth, and infrequently partial epithelialization at the umbilical base may happen with granulation tissue formation. The resolution of normal granulation tissue of umbilical stump should disappear during the 2<sup>nd</sup> or 3<sup>rd</sup> week after labor [4]. Granulation tissue can develop considerably at the umbilical area and results in granuloma, which is usually detected by parents after the cord separation because of the drainage of serosanguinous or serous fluid or persistent moisture around the umbilicus. Persistence of granuloma after the 3<sup>rd</sup> week will necessitate treatment [4]. The treatment modalities of this condition might include chemical cauterization, electric cauterization, cryo cauterization, ligation, and surgical excision [1]. Silver nitrate cauterization is the most widespread management and usually needs several applications and might cause a slight burn at the application site [5]. Topical steroid is an alternative in the treatment of neonatal umbilical granuloma with inferiority to silver nitrate [6, 7]. Schmitt, in 1972, mentioned that common salt can cause shrinking of umbilical granuloma [8].

From ancient times, salting newborn babies was a common practice used to indicate and repel the presence of evil among early Middle-Eastern

populations, including early Christians and Greeks. [9] This ancient practice is described in the Bible (Ezekiel-16:4-6, and Jeremiah-2:22-23). It was a common practice among Jews until the last years. Other peoples of the Middle East and some Arabs also salted their infants, and some of them continue to do so. This practice is shown in Palestine, Syria, the Jordanian Kingdom, Saudi Arabia, Qatar, Iran, Turkey, the Balkans, and Greece. In much the same way as Galen, the Arabs still believe that salt hardens the newborn's skin and protects him or her from the air [7]. This practice is not common in Iraq. Infant salting may cause fatal hypernatremia if it is used for a long period and on a large area of baby skin, although it is rare in the literature [10, 11]. This practice may allow for the development of using salt in the treatment of umbilical granulomas.

## Aims of the study

To study the therapeutic outcome of table salt as a treatment of umbilical granuloma in neonates and to compare it with silver nitrate.

## Patients and methods

The randomized controlled study was conducted in a pediatric clinic in Mosul city between Dec. 2018 and Jan. 2019. The study involved a total number of 85 neonates (2-4 weeks), both males and females (41 males and 44 females), with umbilical granuloma clinically evident. Any neonates with signs of infection at the umbilicus, previous treatment of umbilical granuloma, subsequent systemic antibiotic use within 1 week, and previous surgical treatment of the umbilicus were excluded from the study. Verbal consent was taken from parents after explaining the nature of the study to them. The patients were divided into two groups: the 1<sup>st</sup> group (group A) comprised 42 patients (20 males and 22 females), the 2<sup>nd</sup> group (group B) comprised 43 patients (21 males and 22 females). Parents of group A patients were instructed to put a small amount of common salt above the granuloma after cleaning it, and to cover the salt by blaster for 30 minutes to keep it in place; after that, the blaster had to be removed, and the umbilicus was cleaned with sterile cotton and some water to remove the salt, and the procedure was repeated daily for 3 days. Group B neonates were treated once by applying clean and dry silver nitrate sticks (20% concentration) at the granuloma,

avoiding contact with normal skin. The procedure was performed by the researcher himself at the pediatric clinic. Statistical analysis was done by using Fisher Exact test. The study was approved by the Pediatric Scientific Committee, College of Medicine, University of Mosul.

## Results

Eighty-five neonates were included in this study. Their age ranged from 14 to 28 days. Forty-four of them were female (51.8%), and 41 were male (48.2%). Group A (n = 42) included neonates treated with common salt, and group B (n = 43) included neonates treated with silver nitrate. **Tab. 1** showed the response to the treatment in both groups; in group A, 39 (92.9%) responded to treatment with salt, while 3 (7.1%) of them did not respond. In group B, 41 (95.3%) responded to treatment by silver nitrate, while 2 (4.7%) did not respond. There is no significant difference between both groups, with p-value = 0.676. **Tab. 2** showed the response to the treatment in group A and group B in male patients. In group A, 19 (95%) of male neonates responded to the treatment, compared to 20 (95.2%) patients in group B, and the difference was not statistically significant, with p-value = 0.99. **Tab. 3** showed the response to treatment in group A and group B in female patients. In group A, 20 (90.9%) of

the female neonates responded to the treatment compared to 21 (95.5%) patients of group B, and the difference was not statistically significant, with p-value = 0.99.

## Discussion

An umbilical granuloma is a widespread umbilical medical problem in newborns, which, if left without treatment, might ooze and become irritating for numerous weeks. There are different curative managements of this medical condition, but each method has advantages and disadvantages [12]. There is evidence for an agent that causes no complications and has a curative result. In this condition, common table/cooking salt is an appropriate substance for the treatment of umbilical granuloma. The first indications linked to salt treatment depend on the results, which appear to be reliable and indicate a good clinical result. Different methods have been recommended for the applications of salt with similar general principles. This procedure is simple and conservative and does not require recurrent medical appointments [13]. Silver nitrate has a caustic effect, which is the factor of its therapeutic function, but healthy tissues in adjacent areas may be hurt if they come in contact with silver nitrate [14, 15]. Results of this study demonstrated that there were no significant differences between silver nitrate and salt groups; despite the fact that the silver nitrate treatment group achieved good results, the author does not recommend it because of a possible burn complication at the periumbilical skin in some patients. So, it is clear that salt application is a rational alternative in the treatment of umbilical granuloma. Salt causes a decrease of granuloma inside the occluded hyperosmolar chamber by different biologic properties, including desiccant effect; moreover, the high sodium ion concentration in the area causes the water to be drawn out of the cells and results in contraction and necrosis of the wet granulation tissue, which is not such a great effect, but it causes no harm to normal adjacent stratum corneum when used for a short treatment period [8, 16, 17]. In recent years radical changes in the world of medicine were seen [18]. A lot of significant information was realized about popular health beliefs; many of them were found to be true and should be reinforced, yet few others were found to be harmful to the babies' health, such as the application of chemicals to the umbilical stump [19]. Sözen et al. said that the application of salt

**Table 1.** Response to treatment among groups A and B.

Responses	Group A	Group B	p-value
Responding, n (%)	39 (92.9)	41 (95.3)	0.676
Not responding, n (%)	3 (7.1)	2 (4.7)	
Total, n (%)	42 (100)	43 (100)	

**Table 2.** Response to treatment among groups A and B in male patients.

Responses	Group A	Group B	p-value
Responding, n (%)	19 (95)	20 (95.2)	0.99
Not responding, n (%)	1 (5)	1 (4.8)	
Total, n (%)	20 (100)	21 (100)	

**Table 3.** Response to treatment among groups A and B in female patients.

Responses	Group A	Group B	p-value
Responding, n (%)	20 (90.9)	21 (95.5)	0.99
Not responding, n (%)	2 (9.1)	1 (4.5)	
Total, n (%)	22 (100)	22 (100)	

(cooking/table salt) to umbilical pilonidal sinus with granuloma is a simple and highly effective way of treatment without any complications or relapse [17]. The results of this study showed that umbilical granuloma can be treated with common salt with no complication in addition to the low cost and easy application of such treatment.

## Conclusion

This study showed that the topical use of common salt is not inferior relative to silver nitrate cauterization, taking into consideration that the latter carries a considerable risk of skin burns, and that the whole efficacy of topical salt treatment is equivalent to that of silver nitrate cauterization; accordingly, topical salt might be considered as a suitable alternative in dealing with neonatal umbilical granuloma due to its effectiveness, safety, and simplicity.

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## Declaration of interest

The Authors declare that there is no conflict of interest. Funding: none.

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