

## Honey in the treatment of Fournier's gangrene as an adjuvant: a cross sectional study

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### Abstract

Fournier's gangrene is a progressive polymicrobial necrotising infection. The purpose of this study was to assess the outcome of Fournier's gangrene infection in patients who received topical honey with their therapeutic regimens. The cross-sectional study included 17 patients with Fournier's gangrene. Under spinal anaesthesia, the necrotic areas were debrided. In the first week, every day, the wounds were cleansed with Betadine, normal saline, and 2% oxygenated water, then 30-50cc of honey was used after the wounds were dried. The wounds were then dressed. This method of dressing was taught to the patients' attendants. The granulation tissues, generally bright pink, were observed on the 10th day. Four (23.5%) patients underwent colostomy and 1 (5.9%) died. All the patients were discharged two weeks after the initial debridement. Compared with other studies, honey reduced the healing and hospitalisation time as well as additional costs.

**Keywords:** Antibacterial, Fournier gangrene, Honey, Infection.

### Introduction

Fournier's gangrene is a progressive polymicrobial necrotising infection of the fascia of the perineum, around the anus and the genitalia area. Two aerobic and anaerobic microbial factors play synergistic roles in the morbidity of the disease.<sup>1,2</sup> Its progression speed is 2-3 centimetres per hour.<sup>3</sup> The tissue destruction following the secretion of collagenase, hyaluronidase, and other enzymes cause vascular thrombosis, destruction, and necrosis. Bauvenne described the disease for the first time in 1764. Diagnosis is based on physical examination and history, while computed tomography (CT) scan and ultrasound are also helpful.<sup>2-4</sup> The average mortality rate of this disease is approximately 20%.<sup>5</sup>

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The wide excision of the necrotic tissue is the basis of the treatment with simultaneous administration of broad-spectrum antibiotics and appropriate liquid therapy.<sup>1,3</sup> Besides, hyperbaric oxygen has been reported to affect wound healing, demanding a treatment longer than one month.<sup>3</sup>

In previous studies, therapeutic effects of honey in treating wounds, including burn wounds, pressure wounds, surgical infections, and even treatment of other infections such as *H. pylori* infection, have been reported.<sup>2,3,6-8</sup> In an enzymic activity, the sugars in the syrup turn into glucose and fructose, and the glucose oxidase enzyme changes glucose into glucuronic acid and hydrogen peroxidase.<sup>3,4,6-9</sup> To our knowledge there is no published article about the effect of honey on Fournier's gangrene. The purpose of this study was to assess the outcome of Fournier's gangrene infection in patients who received adjuvant topical honey along with their therapeutic regimens.

### Methods and Results

The cross-sectional study was conducted on 17 patients with Fournier's gangrene in Shohada-ye Ashayer Hospital in Khorramabad, Iran, from December 2003 to December 2010. Fournier's gangrene was detected using physical examination and history. All the patients underwent debridement and extensive excision. In the operating room and under spinal anaesthesia, the necrotic areas were debrided and the necrotic tissues were removed in several stages so that the bleeding tissues were observable. This procedure was done every other day. For better haemodynamic assessment, central venous catheters were placed and broad-spectrum antibiotics, including ceftriaxone, metronidazole and amikacin, were administered.

The mean age of the patients was 47±15.8 years (range: 28-84). Eight (47%) patients were diabetic, 4 (23.5%) patients abused illegal drugs, 1 (5.8%) case suffered from hepatitis C, and 2 (11.7%) cases were infected with hepatitis B. A 75-year-old diabetic patient with ischiorectal abscess and extensive necrosis of the scrotum and the penis died 6 hours after the operation in spite of

being sent to intensive care unit (ICU).

Owing to the late referral of the patients, the injury had spread to the base of the penis and above the external inguinal ring, resulting in the involvement of the fascia. In 2 (11.7%) patients who had developed the disease due to testicular abscess, orchiectomy was performed simultaneously with extensive debridement. In 8 (47%) cases, the infection had spread to the internal ring area, nearly 3 centimeters above the symphysis pubis.

Fournier's gangrene was developed due to initial perianal abscess in 10 (58.8%) patients, pressure on the scrotum in the hip cleavage in ICU in 2 (11.7%) patients, pelvis fracture and extensive scrotal haematoma in 1 (5.8%), chronic orchitis in 2 (11.7%), and injecting illegal drugs into the scrotum vessels in 2 (11.7%) patients.

Out of the 10 cases with perianal abscess, loop colostomy was performed in 4 (23.5%) cases by General Surgery colleagues with simultaneous debridement. These patients suffered from ischiorectal abscess and 1 (5.8%) patient did not survive. After that, extensive debridement was conducted so that the bleeding tissues could be seen. Then the wounds were cleansed with Betadine, normal saline, and 2% oxygenated water.

In the first week, the cleansing was done using normal saline under anaesthesia in the operating room every other day and 30-50cc of honey was used on the site after it was dried, and then the wound was dressed. This method of cleansing and dressing was taught to the patients and their attendants in the ward so that they would be able to continue the treatment at home. The patients were asked to report to the hospital every other day after the discharge for follow-up. The sterility of the wounds was checked and confirmed through microbiological tests.

In 13 (76.4%) patients, except the ones who underwent colostomy, the testicle was placed in the upper thigh and the wound was closed with bilateral perineal advanced flap on the 20th day. In the remaining 3 (17.6%) patients, the wounds were closed after 25 days simultaneously when the colostomy wounds were closed using the procedure already mentioned. None of the patients underwent cystostomy due to lack of urinary tract involvement.

The patients received 3-5 operative procedures for debridement in the operating room. No complications were seen except slight secretions of darren penrose in 4 (23.5%) patients. However, the secretions stopped after 3 days.

From the 10th day, granulation tissues, bright pink in colour, were seen in all the patients. On the 8th day, 3 patients, on the 10th day 9 (53%), and two weeks after the surgery 4 (23.5%) cases were discharged. The mean hospitalization time in our study was 12±6 days, which was much less than in studies that didn't use honey as part of therapy.<sup>10</sup>

## Conclusion

Though the study did not have a control group, the healing time as well as hospitalisation time and additional costs were lesser than similar studies. It may be due to the antibacterial effect or other properties of honey. The mortality rate in our study was lower than the rates in other studies considering the extent of the disease and the lesions. We suggest that the effect of honey on Fournier's gangrene shall be further assessed through placebo controlled clinical trials.

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## References

1. Namias N. Honey in the management of infections. *Surg Infect (Larchmt)*. 2003; 4: 219-26.
2. Unalp HR, Kamer E, Derici H, Atahan K, Balci U, Demirdoven C, et al. Fournier's gangrene: evaluation of 68 patients and analysis of prognostic variables. *J Postgrad Med* 2008; 54: 102-5.
3. Erikoglu M, Tavli S, Turk S. Fournier's gangrene after renal transplantation. *Nephrol Dial Transplant* 2005; 20: 449-50.
4. Santora T, Rukstalis DB. Fournier Gangrene. Medscape website. (Online) (Cited 2011 March 2). Available from URL: <http://emedicine.medscape.com/article/438994-overview>.
5. Subrahmanyam M, Ugane SP. Honey dressing beneficial in treatment of Fournier's gangrene. *Indian J Surg* 2004; 66: 75-7.
6. Hejase MJ, Simonin JE, Bihle R, Coogan CL. Genital Fournier's gangrene: experience with 38 patients. *Urology* 1996; 47: 734-9.
7. Safioleas M, Stamatakos M, Mouzopoulos G, Diab A, Kontzoglou K, Papachristodoulou A. Fournier's gangrene: exists and it is still lethal. *Int Urol Nephrol* 2006; 38: 653-7.
8. Moore OA, Smith LA, Campbell F, Seers K, McQuay HJ, Moore RA. Systematic review of the use of honey as a wound dressing. *BMC Complement Altern Med* 2001; 1: 2.
9. Wein AJ, Kavoussi LR, Novick AC, Partin AW, Peters CA. *Campbell-Walsh Urology*. 9th ed. Philadelphia: Saunders Elsevier, 2007; pp-302.
10. Subrahmanyam M. A prospective randomised clinical and histological study of superficial burn wound healing with honey and silver sulfadiazine. *Burns* 1998; 24: 157-61.
11. Subrahmanyam M. Early tangential excision and skin grafting of moderate burns is superior to honey dressing: a prospective randomised trial. *Burns* 1999; 25: 729-31.
12. Cooper RA, Halas E, Molan PC. The efficacy of honey in inhibiting strains of *Pseudomonas aeruginosa* from infected burns. *J Burn Care Rehabil* 2002; 23: 366-70.
13. Phuapradit W, Saropala N. Topical application of honey in treatment of abdominal wound disruption. *Aust N Z J Obstet*

- Gynaecol 1992; 32: 381-4.
14. Subrahmanyam M. Honey impregnated gauze versus polyurethane film (OpSite) in the treatment of burns-a prospective randomised study. *Br J Plast Surg* 1993; 46: 322-3.
  15. Subrahmanyam M. Honey dressing versus boiled potato peel in the treatment of burns: a prospective randomized study. *Burns* 1996; 22: 491-3.
  16. Molan PC. Potential of honey in the treatment of wounds and burns. *Am J Clin Dermatol* 2001; 2: 13-9.
  17. Stephen-Haynes J. Evaluation of a honey-impregnated tulle dressing in primary care. *Br J Community Nurs* 2004; Suppl: S21-7.
  18. Efem SE. Recent advances in the management of Fournier's gangrene: preliminary observations. *Surgery* 1993; 113: 200-4.
  19. Subrahmanyam M. Topical application of honey in treatment of burns. *Br J Surg* 1991; 78: 497-8.
  20. Mehl AA, Nogueira Filho DC, Mantovani LM, Grippa MM, Berger R, Krauss D, et al. Management of Fournier's gangrene: experience of a university hospital of Curitiba. *Rev Col Bras Cir* 2010; 37: 435-41.
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