

Case study

Impact of *Ingudi (Balanites aegyptiaca Linn. Delile)* seed oil on *Prameha*

Pidika (Diabetic carbuncle): A case study

ABSTRACT

Background: We conducted a thorough review of the literature on the use of medicinal plants and plant-based products for topical ulcers and discovered that natural products and natural product derivatives account for more than half of all medications taken globally today. **Case presentation:** A fifty-eight-year-old gentleman belonging to middle socioeconomic status developed a carbuncle at the right side of the nape of the neck with granulating firm edge and a necrotic slough on the floor with minimal foul-smelling on the right side near the hairline. Despite her attempts to treat the carbuncle at home and local physicians "it continued to enlarge and fester" (became inflamed and suppurated). The patient was visited the Trauma surgery OPD, BHU Trauma center & Super specialty Hospital, Institute of Medical Sciences, Banaras Hindu University, Varanasi and, following surgical incision and drainage, ET nurse consultation was requested to establish a wound treatment regimen but injury gave no indication of progress. Then the patient was referred to the Ayurvedic wing of Banaras Hindu University for Ayurvedic management. The aims of this case study are to anticipate the clinical efficacy of Ingudi seed oil in the treatment of chronic diabetic wounds, which is a complex type of Diabetic carbuncle (*Prameha pidika*). Ingudi oil treatment proved to be convincing and the wound healed completely within 45 days. In either case, another evaluation should be completed by drawing a huge sample size to demonstrate its importance in treating diabetic wounds. **Conclusion:** Ingudi seed oil has prompt healing properties against diabetic wounds. Ingudi seed oil is natural, safe, and cost-effective for the healing of chronic diabetic wounds (*Prameha pidika*).

Keywords: *Balanites aegyptiaca*, *Ingudi*, Carbuncle, Wound, *Pidika*

Background

Diabetes is a common disease occurring in 8.3 percent of the world's population [1]. Skin disease will occur in 79.2% of people with diabetes [2]. Carbuncle, also known as infectious gangrene of the skin and subcutaneous tissue, is most commonly caused by sama.carlson@yahoo.com

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Post-traumatic Digital Gangrene Associated with Epinephrine Use in Primary Raynaud's Phenomenon: Lesson for the Future *Ethiop J Health Sci.* Vol. 26, No. 4 July 2016, which usually begins as a boil around the root of a hair follicle [3]. According to *Ayurveda Prameha pidika* is another name for diabetic carbuncle. *Prameha* (Diabetes) is a urinary disorder, while *pidika* refers to boil or carbuncle. Ten kinds of *Prameha pidika* (Diabetic carbuncle) are explained in *Sushruta Samhita* [4]. A carbuncle is a collection of furuncles of various sizes is a deep-seated infection of a hair follicle that may lead to an abscess [5].

Case presentation

Type of Study

Observational single case plan without a control group.

Study center

Trauma surgery OPD, BHU Trauma center & Super specialty Hospital, Institute of Medical Sciences, Banaras Hindu University, Varanasi, 221005

A fifty-eight-year-old gentleman belongs to middle socioeconomic status reported in the study center on 5th September 2017. The registration no is 2017/76253 and serial no-156740, with chief complaints of painful non-healing ulcer over the nape of the neck with foul odor discharge for 6 months. The size of the wound was 5x3 cm with a granulating firm edge and necrotic slough on the floor with minimal foul-smelling purulent discharge [Figure 1]. The patient had a history of empirical intake of anti-tubercular treatment for six months and underwent serial surgical debridement. The reports of biochemical tests and other investigation showed some parameters were normal such as pulse 82/minute, temperature 98.70F; B.P. was 128/76 mm of

Hg while others were raised such as ESR (36 mm/hrs.) and total leucocytes count (12000/mm³), fasting blood sugar 136 mg /dl, postprandial sugar 186mg/dl. The previous history of the patient treatment was surgical debridement, local steroidal ointment; with a Povidone-Iodine dressing after wound debridement, the patient was taking broad-spectrum antibiotics, multivitamins, anti-inflammatory, and analgesic drugs. Since the injury did not indicate progress, he selected elective treatment for a similar issue without careful medication. Therefore, the patient was referred to the Ayurvedic wing of Banaras Hindu University for Ayurvedic management.

Plant Material Collection

Ingudi fruit seeds were obtained from Munaganj village, Etawah district, Uttar Pradesh, India, after scientific authentication at Dravyaguna Department, Faculty of Ayurveda, Banaras Hindu University, Varanasi, with accession number DG / 1819 / 194(nuts).

Extraction of Oil Seed

The oil extraction of Ingudi seeds was carried out by the oil pressing method (direct expeller) without chemical additives, and dark yellow oil was found. It's inexpensive, chemical-free, and versatile.

Therapeutic Focus and Assessment

For the above-mentioned clinical delivery systems, for example, *Chedana* (extraction), *Bhedana* (pointed injury), *Parisheka* (wound irrigation) are used in Ayurveda during treatment [6].

The patient was investigated and applies to Ingudi oil started just after wound debridement and dressing. The patient was advised for proper dressing and applies two-three droops of Ingudi oil two times a day. All drugs used in previous treatment was brought to a close except anti-diabetic drug after taking consent from the surgeon and patient.

Result

In this study, malodor was controlled after 15 days and discharge was controlled after 30 days. The surrounding skin color returned to normal within 45 days. Pain sensation at the wound site recovered within 30 days due to neovascularization. The patient recovered the sensation of pain in the nerve fibers. The size of the wound was completely reduced in 45 days. The signs of infection disappeared on day 30 and completely disappeared on day 45 [Figure 1].

Discussion

Adults are frequently affected by carbuncles [7]. The carbuncle is a large painful swelling on the skin with many pus-filled openings. The human pathogenic gram-positive bacteria, *staphylococcus sp.*, and *Streptococcus sp.* cause carbuncle. Carbuncle is a common ailment that affects the diabetic patient and more sensitive sites for this infection are the napes of the neck, back, and hip [8]. In ancient times female patients have been able to cure diabetic wounds with Ingudi seed oil [9]. People all over the world have been benefiting from the traditional system of medicine for thousands of years [10]. According to an allopathic system of medicine, antibiotics are given early in the treatment of carbuncles, followed by excision [11]. The previous history of the patient treatment was surgical debridement, local steroidal ointment; with a Povidone-Iodine dressing after wound debridement, the patient was taking broad-spectrum antibiotics, multivitamins, anti-inflammatory, and analgesic drugs but to no avail. In this study, the patient was investigated and applies *Ingudi oil* started just after wound debridement and dressing. The patient was advised for proper dressing and applies two-three droops of *Ingudi oil* two times a day, the patient started to understand a lot of benefits from applying it. The seed oil's properties, *Krimighna* (antibacterial) and *Vishaghna* (antioxidant) helped control topical infection and ultimately fight odor [12]. In phytochemical studies, presence of phenolic compounds, saponin glycosides, tannins, flavonoids, proteins, amino acids, fats, oils, and volatile oils [13]. Due to the astringent and antimicrobial properties of flavonoids and tannins in Ingudi seed oil responsible for wound healing through increase epithelialization speed in the chronic wound [14]. *Ingudi* also shows comparative types of wound healing movements due to the essence of a persistent antimicrobial property, flavonoids, and tannins. The result of complete termination of discharge was observed within 30 days. The pain was reported as an inpatient due to diabetic neuropathy. After treatment with Ingudi seed oil, pain sensation returned within 30 days due to neovascularization, and pain sensation was restored. The *Snigdha* Guna (unctuous property) of Ingudi tail helped to control the violation of *Vata* and helped alleviate the pain. Ingudi's anti-inflammatory and analgesic activity helps control wound pain [15]. Ingudi seed oil is a potent chronic wound healer and it will be assuring natural drugs in skin diseases, to heal burn wounds, and to cure worms [16]. Oleic acids and linoleic acid are the main fatty acids found in Ingudi followed by palmitic acid and stearic acid [17]. The most

common bacteria for infectious gangrene of the skin is *S. aureus*, 3 and a study revealed that Ingudi oil shows a significant effect on antimicrobial activity against *S. aureus* [18].

Conclusions

Chronic diabetic wound healing is crucial for the successful treatment of the patient with, pain, foul odor discharge, granulating firm edge, and necrotic slough. This case report tells us that apart from antibiotic, antiseptic, and local steroidal ointments for chronic wounds, the patient has to undergo prolonged treatment for several days, and sometimes oral antibiotics have to be taken, which costs a lot of money and the side effects of antibiotics also have to be troublesome. Ingudi seed oil has the potential to heal the complex wound and this will also benefit the patient economically and healing will also be good in lesser days. This natural oil is a boon for people suffering from non-healing diabetic wounds. Ingudi seed oil is greasy, natural, safe, and expensive for treating chronic, non-healing wounds.

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Figure 1: Stage wise pictures of the diabetic wound during the intervention. A. wound on the first day before intervention (Size- 5 x 3 cm) B. wound after 15th day (Size- 4.6 x 2.8 cm) C. Wound after 30th day (Size- 2.8 x 1.6 cm) D. wound after 45th day (completely closed)