



Research Journal of Pharmacognosy 5(1), 2018: 1-3

Received: 29 June 2017

Accepted: 28 Aug 2017

Published online: 27 Dec 2017

Case report

## Allergic Contact Dermatitis by *Boswellia carterii* Ointment in a Deep 2<sup>nd</sup> Degree Burn Wound: a Case Report

P. Badr<sup>1,2</sup>, A.A. Mohammadi<sup>3\*</sup>, S. Daneshamouz<sup>4</sup>, S. Afsharypuor<sup>5</sup>, M. Ayaz<sup>3</sup>

<sup>1</sup>Phytopharmaceutical Technology and Traditional Medicine Incubator, Shiraz University of Medical Sciences, Shiraz, Iran.

<sup>2</sup>Pharmaceutical Science Research Center, Shiraz University of Medical Sciences, Shiraz, Iran.

<sup>3</sup>Shiraz Burn Research Center, Shiraz University of Medical Sciences, Shiraz, Iran.

<sup>4</sup>Department of Pharmaceutics, School of Pharmacy and Pharmaceutical Sciences Research Center, Shiraz University of Medical Sciences, Shiraz, Iran.

<sup>5</sup>Department of Pharmacognosy, Faculty of Pharmacy, Isfahan University of Medical Sciences, Isfahan, Iran.

### Abstract

Numerous scientific texts insist on safe topical application of specific herbal products like those containing *Boswellia* oleogumresin, but adverse effects arising during clinical trials of herbal medicines give the opportunity to clarify the blind spots in the area of drug safety. A 36-year-old woman without allergic background had two burn wounds because of hot oil. Her hand's wound was diagnosed a superficial 2<sup>nd</sup> degree while the wound of her thigh was a deep 2<sup>nd</sup> degree. She was enrolled in a single-blind randomized clinical trial. Having been recruited in the *Boswellia* group, she received the formulation on the 3<sup>rd</sup>, 5<sup>th</sup>, 7<sup>th</sup>, 9<sup>th</sup>, and 11<sup>th</sup> day after her injury. The wound of her hand was completely healed on the 13<sup>th</sup> day without showing any adverse reactions, but she was suffering from irritation and pruritus on her thigh. In our experience, complete healing of the patient's hand wound without any side effects proved safe usage of the product for superficial burns, but its application in deeper injuries like the one on her thigh demonstrated the higher probability of severe reactions.

**Keywords:** allergic contact dermatitis; burn wound; *Boswellia carterii*

### Introduction

Numerous scientific texts insist on safe topical application of specific herbal products like those containing *Boswellia* oleogumresin. Using *Boswellia* cream 2% twice daily after radiotherapy have been well tolerated showing no severe side effects [1]. Bosexil<sup>®</sup> cream containing *Boswellia serrata* extract has been safely applied

for psoriatic and eczematous symptoms, so it is even suggested for contact dermatitis [2]. According to Unani system of medicine, topical application of *Boswellia* with honey or swine fat has been advised for septic wounds and burns [3]. Adverse effects arising during clinical trials of herbal medicine give the opportunity to clarify

\*Corresponding author: mohammadiaa@sums.ac.ir

© 2018. Open access. This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (<https://creativecommons.org/licenses/by-nc/4.0/>)

the blind spots in the area of drug safety.

### Case description

A 36-year-old woman without allergic background had two burn wounds because of hot oil. Her hand's wound was diagnosed a superficial 2<sup>nd</sup> degree while the wound of her thigh was a deep 2<sup>nd</sup> degree. She was enrolled in a single-blind randomized clinical trial approved by ethics committee of Shiraz University of Medical Sciences (CT-90-5981 under registry number IRCT 201208041605 N14). The clinical trial had been designed to compare burn wound healing effect of *Boswellia carterii* 40% ointment with silver sulfadiazine 1% cream in two 25-patient groups and was conducted during July 2012 and August 2013. Having been recruited in the *Boswellia* group, she received the formulation on the 3<sup>rd</sup>, 5<sup>th</sup>, 7<sup>th</sup>, 9<sup>th</sup>, and 11<sup>th</sup> day after her injury. The wound of her hand was completely healed on the 13<sup>th</sup> day without showing any adverse reactions, but she was suffering from an inflammatory intolerance characterized by coexistent erythema, exudation, papules, flaking, and itching on her thigh (figures 1,2). Being excluded from the trial, she received topical corticosteroid for three days. Also, Vitamin A&D ointment was prescribed for her to prevent wound desiccation. Her complaint on 19<sup>th</sup> day was just mild pruritus after tomato or aubergine consumption. Her application of the ointment base (*Boswellia*-free) caused no reaction. In addition, patch test with *Boswellia* ointment was performed on eight healthy volunteers who showed no signs of hypersensitivity. The prepared ointment for trial was composed of 40% *B. carterii* oleogumresin ( $\gamma$ -sterilized, 25kGy), 30% sterile purified water, 20% duck fat and 10% sesame oil. The final product had been standardized according to  $\beta$ -boswellic acid (0.70 % content). Furthermore, the essential oil of *B. carterii* oleogumresin composed of 76.5% octyl acetate as its major compound [4].

### Discussion

*Boswellia* trees or shrubs (Burseraceae family)

with 20 species, produce a commercially valuable exudate which is vastly used in cosmetic and pharmaceutical industries [5]. It contains about 60% resin, 6-9% essential oil, and more than 10% gum. Wide antimicrobial and anti-inflammatory activities of *Boswellia* are supportive proofs for its wound-healing effects [6]. Despite its reputation for safe topical application, a single case of contact dermatitis was reported due to a herbal remedy containing the extract of *B. serrata* [7]. In a patch study, the exudate of other plant of Burseraceae family (*Commiphora myrrha*) has been reported to develop positive reactions [8]. Exposure to different essential oils such as lavender oil, neroli oil, peppermint oil, and rose oil have caused contact dermatitis [9]. Because *Boswellia* oleogumresin contains essential oil, its topical usage specifically on injured skin, may result in such reactions.



**Figure 1.** Burn wound healing with no reaction to *Boswellia* ointment in a superficial burn wound (Day 13)



**Figure 2.** Contact dermatitis due to *Boswellia* ointment in a deep 2<sup>nd</sup> degree burn wound of the same patient (Day 13)

In our experience, complete healing of the

patient's hand wound without any side effects proved safe usage of the product for superficial burns, but it showed the higher probability of severe reactions in deeper injuries like the one on her thigh. Indeed, the concentration of *Boswellia* in wound healing products should be precisely taken into consideration, and avoidance of high-concentrated formulations for deep wounds is strictly advisable.

### Acknowledgments

This article, as a part of a Ph.D. thesis, was supported by grant No.90/5981, Shiraz University of Medical Sciences, Shiraz, Iran.

### Declaration of interest

The authors declare that there is no conflict of interest. The authors alone are responsible for the content of the paper.

### References

- [1] Togni S, Maramaldi G, Bonetta A, Giacomelli L, Di Pierro F. Clinical evaluation of safety and efficacy of *Boswellia*-based cream for prevention of adjuvant radiotherapy skin damage in mammary carcinoma: a randomized placebo controlled trial. *Eur Rev Med Pharmacol Sci*. 2015; 19(8): 1338-1344.
- [2] Togni S, Maramaldi G, Di Pierro F, Biondi M. A cosmeceutical formulation based on boswellic acids for the treatment of erythematous eczema and psoriasis. *Clin Cosmet Investig Dermatol*. 2014; 7: 321-327.
- [3] Sultana A, Rahman Kh, Padmaja AR, Rahman Sh. *Boswellia serrata* Rox. A traditional herb with versatile pharmacological activity: a review. *Int J Pharmaceut Sci Res*. 2013; 4(6): 2106-2117.
- [4] Badr P, Daneshamouz S, Mohammadi AA, Akbarizadeh AR, Afsharypuor S. The effect of <sup>60</sup>Co-gamma radio-sterilization on *Boswellia carterii* essential oil composition. *Res J Pharmacogn*. 2016; 3(4): 67-74.
- [5] Moussaieff A, Mechoulam R. *Boswellia* resin: from religious ceremonies to medical uses; a review of *in-vitro*, *in-vivo* and clinical trials. *J Pharm Pharmacol*. 2009; 61(10): 1281-1293.
- [6] Wichtl M. *Teedrogen und phytopharmaka*. 5<sup>th</sup> ed. Stuttgart: Wissenschaftliche Verlagsgesellschaft, 2009.
- [7] Acebo E, Raton JA, Sautua S, Eizaguirre X, Trebol I, Perez JLD. Allergic contact dermatitis from *Boswellia serrata* extract in a naturopathic cream. *Contact Derm*. 2004; 51(2): 91-92.
- [8] Calapai G, Miroddi M, Minciullo PL, Caputi AP, Gangemi S, Schmidt RJ. Contact dermatitis as an adverse reaction to some topically used European herbal medicinal products-part 1: *Achillea millefolium*–*Curcuma longa*. *Contact Derm*. 2014; 71(1): 1-12.
- [9] Bleasel N, Tate B, Rademaker M. Allergic contact dermatitis following exposure to essential oils. *Australas J Dermatol*. 2002; 43(3): 211-213.