



## Comparing the etiology and treatment of skin fissure in traditional and conventional medicine; a brief review

A. Jedkareh<sup>1,2</sup>, S. Esmaili<sup>2,3\*</sup>, A. Alembagheri<sup>2</sup>, S.A. Mortazavi<sup>4</sup>

<sup>1</sup>Pharmaceutical Sciences Branch, Islamic Azad University, Tehran, Iran.

<sup>2</sup>Traditional Medicine and Materia Medica Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

<sup>3</sup>Department of Traditional Pharmacy, School of Traditional Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

<sup>4</sup>Department of Pharmaceutics, School of Pharmacy, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

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### Abstract

Dry skin is a common problem which affects wound healing, severity of other skin diseases and quality of life of people. One of its undesirable effects is fissure that is a cutaneous condition in which there is a linear loss of epidermis and dermis with sharply defined, nearly vertical walls. In the present study, we have investigated the etiology of the disease and its treatments in conventional medicine and Iranian Traditional Medicine (ITM). Two traditional medicine references, current scientific data bases and medicinal texts were explored with the selected keywords such as "sheqaq-e-poosti", "skin fissure" and "dry skin" to find the etiology and treatment of skin fissure. From the view point of both conventional medicine and ITM, dry skin is the cause of skin fissure and some causes of dry skin are similar. In conventional medicine, moisturizers are mainly used for treatment of dry skin; while in ITM some herbs, oils and other natural remedies have been used. A topical dosage form which was called "qeirooti", a mixture of wax and oil, was used to treat skin fissure in ITM. It comprised of oily ingredients that acted as occlusives and also some herbal components that directly improved dry skin (similar to moisturizers). Components efficacy of traditional dosage forms for treatment of dry skin lead us to study about formulation of "qeirooti" for treatment of dry skin.

**Keywords:** dry skin, Iranian Traditional Medicine, qeirooti, skin fissure

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### Introduction

Skin is the largest organ in the human body which is an effective barrier between the organism and the outside environment that helps to reduce the risk of physical, biological and chemical damages. It is divided histologically into the stratum corneum (the outer layer) and the dermis [1]. The barrier properties of the skin are

mainly localized in the stratum corneum. This layer contains corneocytes that are surrounded by a neutral lipid-enriched intercellular matrix. Fifty percent of the intercellular lipids are ceramides which are effective in maintaining epidermal water. The ceramides, cholesterol and fatty acids affect epidermal permeability barrier. Structural

and metabolic problems in the epidermis decrease barrier function of the skin [2]. So, special attention should be given to the skin illnesses which are one of the most important human diseases. They occur in all ages and affect 30 to 70 percent of people. Their harmful effects on people's lives include physical disability to death so they cause a huge burden in the global health [3].

Dry skin is a common problem which affects wound healing, severity of other skin diseases and quality of people lives [4]. One of its complications is fissure in which epidermis and dermis are deep cut or cracked. Dryness and chapping are the initial changes and very painful cracks and fissures occur afterwards which cause severe problems.

From the viewpoint of conventional medicine, the cutaneous diseases are divided into two forms, primary lesions and secondary lesions. Most skin diseases begin with a basic lesion that is referred to the primary lesion and the secondary lesions are developed during the evolutionary process of the skin disease or are created by scratching or infection. One of the secondary lesions is skin fissure that is a linear loss of epidermis and dermis with sharply defined, nearly vertical walls and the main factor for its occurring is the dryness of skin [5]. The cutaneous lesions and related diseases have been explained in the Iranian Traditional Medicine as kind of cutaneous edemas and rashes; one of these cases has been referred fissure [6]. The aim of the present study was to compare the etiology and treatment of skin fissure both from the traditional and conventional medicine viewpoints to propose an effective treatment for skin fissure.

### Methods

Two Iranian Traditional Medicine (ITM) books including "Canon of Medicine" and "Gharabadin-e-kabir" were studied for "sheqaq-e-poosti" which can be translated to "skin fissure". Available scientific data bases such as "PubMed" and "Google Scholar" and medicinal texts were

searched with related terms such as; dry skin and fissure. The selected key words were considered to find the etiology and treatment of skin fissure in ITM and conventional medicine.

### Results and Discussion

#### *Dry skin from the view point of conventional medicine*

The term of dry skin is the expression of the skin that has a rough, dry or scaly appearance with the possible presence of redness, cracking, or itching [7]. Dry skin can occur due to sun damage, immature cells in the surface of the skin as in psoriasis or genetic changes in the desquamation process, as in atopic dermatitis. If surface corneocytes or intercellular lipids lose their moisture, flexibility of stratum corneum is reduced. Reducing flexibility results in cracking, changing the outer layer and propagating cracks through the stratum corneum barrier. The normal flexing of the damaged skin that has little flexibility increases scaling and cracking [8]. Later, irregular erythematous lines can appear. If pruritus develops, scratching and rubbing resulted in some clinical situations, such as eczema. Initially, the hands, lower legs and dorsal forearms are affected with dry skin [7]. Although the dry skin is not a life-threatening illness, its unpleasant symptoms can reduce the quality of life [9].

To better explain the complexity of dry skin, external factors which may actually induce dry skin must be considered; first of all, the physiology of the stratum corneum layer that is individual keratinocytes joined by complex lipid bilayers. The protein lipid matrix within the keratinocyte needs moisture to be flexible. Lack of moisture in the matrix makes stratum corneum to become stiff and nonpliable, therefore, during the cold and dry weather, microscopic mechanical cracks are created in the skin [8]. Factors such as cold weather or low humidity decrease the water content of stratum corneum. In addition to these factors, exposure to wind and ultraviolet radiation can affect normal skin's barrier function which leads to an increase in

TWEL (transdermal water loss) and dry skin [7,10]. Dry skin most likely has a genetic base where family background plays a role. Diseases such as hypothyroidism or uremia and previous use of certain drugs such as lithium or isotretinoin can induce dry skin. People with chronic diseases may also be troubled by dry skin. Any factor that removes the epidermal barrier of the skin can increase transepidermal water loss and produces dry skin. Organic solvents and harsh detergents which remove the lipid layers of the stratum corneum, can reduce its barrier function [7].

The patients with atopic dermatitis have significantly lower levels of ceramides compared to normal subjects because they have dry skin. Dry skin can be a life-long problem that can worsen over the years. A reduction in sebum and ceramide production in aged skin and age-related changes in collagen content can lead to the increased incidence of dry skin in the elderly [7,10].

#### *Treatment of dry skin from the view point of conventional medicine*

The main intervention for the treatment of dry skin includes topical treatments, fluid intake, balancing sunlight exposure and treating any exacerbating conditions. The skin indicators of tissue integrity include the recovery of skin smoothness and suppleness as manifested by decreased skin scaling and flakiness, repair of cracking and redness, and removal of hyperkeratosis, rash, or itching associated with dry skin [11]. Treatment of dry skin is carried out with the purpose of restoration of the epidermal water barrier. This purpose is obtained with moisturizers that are applied topically on the skin. The person must avoid excessive bathing or use of hot bath or showers. The use of mild soaps rather than harsh soaps or detergents should be recommended. Balneotherapy are used to hydrate the skin in a way that the oils can be added to the bath water or used after the bath. Emollients (occlusive agents) can be used to increase hydration of stratum corneum [7]. The use of

lipids, physiological lipids, humectants and antipruritics will help to improve skin hydration, increase skin elasticity and decrease itching. An ideal emollient will also contain an agent to support epidermal differentiation. Choosing the correct emollient and using it regularly plays an important role in the treatment of dry skin [9], while adequate fluid intake is important in controlling dry skin. The recommended minimum fluid intake is about nine 8-ounce cups of fluid per day. Due to the effects of the sun, when the light intensity is high, the exposure should be reduced [11].

#### *Dry skin from the view point of Iranian Traditional Medicine*

From the viewpoint of ITM, the fissure was a crack and scar that has occurred in the hands, feet, face, lips and anus [6]. In these cases, the main reason was dry skin. The dryness of skin may be the result of (a) exposure to hot or cold weather and wind (b) an astringent bath, (c) overabundance of waste humors, (d) abnormal temperament [12].

#### *Treatment of dry skin from the view point of Iranian Traditional Medicine*

In ITM, the cause of the disease should be focused on reaching a successful treatment. If the cause was a bad humor, it must be cleaned. In the cases that it was caused by abnormal temperament, the temper should be improved. If the skin had cracked due to heat, medications were used which provided moisture and coldness. When the skin had cracked due to cold weather, some herbal treatments such as *Robina pseudoacacia* and *Brassica rapa* have been used for treatment. The person must correct his diet and use lukewarm water for bathroom [12].

Dry feet were recommended to be immersed in warm water then rubbed with oil or fat. The fats of goat and cattle, castor, olive and sesame oil have been suggested for dry feet. Before applying medication on feet, the person should immerse his feet in warm water. After a little softening,

appropriate sticky remedies have been applied [12].

According to the results of several studies, there has been an advance from traditional moisturizers towards ceramide-dominant physiological lipid-base barrier-repair topical emulsions; these formulations for restoring the normal balance of the epidermal barrier emphasize on physiologic lipid replacement therapy, mainly ceramides. Compared to other emollients that provide a superficial occlusive barrier (e.g., petrolatum), ceramide-dominant moisturizers are thought to penetrate the stratum corneum and to be synthesized in the keratinocytes, processed in the lamellar bodies, and released back into the stratum corneum, so they become a part of the dermal matrix [13]. Herbal oils have an extensive potential for treatment of dry skin with their ability to prevent water loss and sometimes by penetrating to the skin and restoring epidermal lipids due to their phytochemical constituents. Historically, almond oil has been used in Ancient Chinese, Ayurvedic and Greco-Persian schools of medicine to treat dry skin diseases such as psoriasis and eczema [14]. The analysis of almond oil has shown the presence of ceramides which were 60% of total sphingolipids [15]. New studies have also shown that some plants such as *Eucalyptus globulus*, *Citrus limon*, *Curcuma longa*, *Emblica officinalis*, *Sesbania grandiflora*, *Grifola frondosa*, *Aloe vera*, *Persea americana*, *Linum usitatissimum*, *Sesamum indicum*, and *Corylus avellana* have demonstrated good effect on dry skin [16-19]. Moreover, among the plants which have been evaluated for improvement of dry skin, those including *Olea europea* and *Beta vulgaris* have been cited in ITM and conventional medicine for prevention or treatment of dry skin [20-22].

ITM has recommended that before applying medication on feet, the person should take a bath and immerse his feet in warm water. When the cracks were a little softened, appropriate sticky remedies have been applied [12], and somehow in the same way, in modern medicine, balneotherapy followed by either addition of oil

to the bath water or rapid application of emollients (occlusive agents) to the skin while leaving from the bath are recommended [7]. Both conventional and traditional systems of medicine advise to correct the diet and use lukewarm water for bathroom [7,12]. Also topical treatments have been recommended in Iranian Traditional Medicine, some of these topical formulations have been called "*qeirooti*" that was a mixture of wax and oil. "*Qeirooti*" had two forms, singular and composite.

The singular form contained a mixture of wax and oil, and if other things were added to the mixture, it was called a composite [23]. Some components of "*qeirooti*" were similar to moisturizers. It had oily ingredients that could act as occlusive and also contained herbal components that directly improved dry skin.

### Conclusion

Comparing Iranian Traditional Medicine and conventional medicine has revealed that, waxes and oils were used for treatment of skin fissure as a secondary lesion in ITM, while the moisturizers which contain herbal oil are used in conventional medicine.

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### 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] Allen LV, Ansel HC. *Ansel's pharmaceutical dosage forms and drug delivery systems*. 10<sup>th</sup> ed. Philadelphia: Lippincott Williams &

- Wilkins, 2014.
- [2] Morifuji M, Oba C, Ichikawa S, Ito K, Kawahata K, Asami Y, Ikegami S, Itoh H, Sugawara T. A novel mechanism for improvement of dry skin by dietary milk phospholipids: effect on epidermal covalently bound ceramides and skin inflammation in hairless mice. *J Dermatol Sci*. 2015; 78(3): 224-231.
- [3] Hay RJ, Johns NE, Williams HC, Bolliger IW, Dellavalle RP, Margolis DJ, Marks R, Naldi L, Weinstock MA, Wulf SK, Michaud C, Murray C, Naghavi M. The global burden of skin disease in 2010: an analysis of the prevalence and impact of skin conditions. *J Invest Dermatol*. 2014; 134(6): 1527-1534.
- [4] Andriessen A. Prevention, recognition and treatment of dry skin conditions. *Br J Nurs*. 2013; 22(1): 26-30.
- [5] Habif TP. *Clinical dermatology: a color guide to diagnosis and therapy*. 3<sup>rd</sup> ed. St. Louis: Mosby, 1996.
- [6] Nafis ebne avaz K. *Sharh ol asbab va alamat*. Tehran: Al-maei, 2012.
- [7] Flynn TC, Petros J, Clark RE, Viehman GE. Dry skin and moisturizers. *Clin Dermatol*. 2001; 19(4): 387-392.
- [8] Spencer TS. Dry skin and skin moisturizers. *Clin Dermatol*. 1988; 6(3): 24-28.
- [9] Lee DH, Seo ES, Hong JT, Lee GT, You YK, Lee KK, Jo GW, Kim NK. The efficacy and safety of a proposed herbal moisturizing cream for dry skin and itch relief: a randomised, double-blind, placebo-controlled trial- study protocol. *BMC Complement Altern Med*. 2013; 13: 330.
- [10] Proksch E, Lachapelle JM. The management of dry skin with topical emollients – recent perspectives. *J Dtsch Dermatol Ges*. 2005; 3(10): 768-774.
- [11] Hurlow J, Zimmaro Bliss D. Dry Skin in older adults. *Geriatr Nurs*. 2011; 32(4): 257-262.
- [12] Avicenna. *The Canon of Medicine*. 5<sup>th</sup> vol. Tehran: Soroush, 1987.
- [13] Wolf R, Parish LC. Barrier-repair prescription moisturizers: do we really need them? Facts and controversies. *Clin Dermatol*. 2013; 31(6): 787-791.
- [14] Ahmad Z. The uses and properties of almond oil. *Complement Ther Clin Pract*. 2010; 16(1): 10-12.
- [15] Malisiova F, Hatziantoniou S, Dimas K, Kletstas D, Demetzos C. Liposomal formulations from phospholipids of Greek almond oil. properties and biological activity. *Z. Naturforsch*. 2004; 59(5-6): 330-334.
- [16] Ishikawa J, Shimotoyodome Y, Chen S, Ohkubo K, Takagi Y, Fujimura T, Kitahara T, Takema Y. *Eucalyptus* increases ceramide levels in keratinocytes and improves stratum corneum function. *Int J Cosmet Sci*. 2012; 34(1): 17-22.
- [17] Bakhtiyari Z, Radan MR, Shariaty MA, Zamany Moghadam M. Medicinal herbs effective on the skin. *Studia Universitatis*. 2014; 24(1): 201-208.
- [18] Saikia AP, Ryakala VK, Sharma P, Goswami P, Bora U. Ethnobotany of medicinal plants used by Assamese people for various skin ailments and cosmetics. *J Ethnopharmacol*. 2006; 106(2): 149-157.
- [19] Nagao M, Sato T, Akimoto N, Kato Y, Takahashi M, Ito A. Augmentation of sebaceous lipogenesis by an ethanol extract of *Grifola frondosa* (maitake mushroom) in hamsters *in vivo* and *in vitro*. *Exp Dermatol*. 2009; 18(8): 730-733.
- [20] Jahandideh M, Ahmadian M, Naseri M, Mosaddegh M. The most useful herbs of Iranian Traditional Medicine prescribed in xerosis. Proceedings of the 13<sup>th</sup> congress of the international society for ethnopharmacology. 2012 Sep 2-6; Graz, Austria.
- [21] Panahi Y, Davoudi SM, Sahebkar A, Beiraghdar F, Dadjo Y, Feizi I, Amirchoopani G, Zamani A. Efficacy of *Aloe vera*/olive oil cream versus betamethasone cream for chronic skin lesions following sulfur mustard exposure: a randomized

- double-blind clinical trial. *Cutan Ocul Toxicol.* 2012; 31(2): 95-103.
- [22] Kawano K, Umemura K. Oral intake of beet extract provides protection against skin barrier impairment in hairless mice. *Phytother Res.* 2013; 27(5): 775-783.
- [23] Aghili Alavi Khorasani MH. *Gharabadin kabir*. 2<sup>nd</sup> vol. Tehran: Institute of history of Islamic medicine and ancient medicine, 2009.