



Effects of *Manna of Alhagi persarum* (Taranjabin) and *Portulaca oleracea* (Khorfeh) Seed Administration on Nickel-induced Allergic Contact Dermatitis: A Case Report

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ARTICLE INFO	ABSTRACT
<p><i>Article type:</i> Case Report</p>	<p>A 19-year-old girl with documented nickel-induced allergic contact dermatitis was referred to the department of traditional Persian medicine five weeks after the sudden onset of bolus and erythematous skin rash to receive treatment based on complementary and alternative medicine. A detailed history of jewelry exposures, lifestyle, food intake, and dietary habits was obtained, as well as the history of other physicians' visits and administered treatments within the past eight weeks. Despite receiving treatment with corticosteroids, anti-histamines, and antibiotics, no satisfactory remission was achieved, and the patient discontinued the treatments. As the alternative medicine approach, treatment was started based on avoiding contact with nickel, administration of <i>Manna of Alhagi persarum</i> and <i>Portulaca oleracea</i> seeds, and avoidance of consuming tomato sauce, cocoa, coffee, and bitter chocolate. Within six weeks, a complete remission of the skin lesions and symptoms occurred. Moreover, normal clinical follow-up was observed after 12 months. Notably, the CARE (CAse REport) guidelines were used in the preparation of this case report.</p>
<p><i>Article History:</i> Received: 01 Mar 2021 Accepted: 31 May 2021 Published: 20 Jul 2021</p>	
<p><i>Keywords:</i> Allergic contact dermatitis Persian medicine Case report Phytotherapy</p>	
<p>► Please cite this paper as: Zakerian M, Derakhshan AR, Roudi F, Motavasselian M. Effects of Manna of Alhagi persarum (Taranjabin) and Portulaca oleracea (Khorfeh) Seed Administration on Nickel-induced Allergic Contact Dermatitis: A Case Report. J Nutr Fast Health. 2021; 9(3): 180-185. DOI: 10.22038/jnfh.2021.56063.1326.</p>	

Introduction

Allergic contact dermatitis (ACD) is a prevalent allergic disease, which is characterized by a delayed hypersensitivity response to the external exposure to allergens (1, 2). Nickel is a widely known allergen, and the prevalence of allergic reactions to this element has increased recently. Nickel-induced ACD may occur due to the prolonged use of nickel-containing provokers of allergic reactions, such as costume jewelry, cosmetic products, and hand tools (2-4). Despite avoidance strategies, promoting skin barrier regeneration, and topical/systematic symptomatic therapies, numerous patients consider complementary and alternative medicine (CAM) therapies (5). Traditional Persian medicine (TPM) is a branch of CAM, which mainly involves the use of medicinal foods and herbs, and the diagnosis and treatment of patients are accomplished by considering every aspect of their clinical condition (6, 7).

The present study aimed to describe the effectiveness of a TPM-based herbal compound in the treatment of a patient with ACD.

Ethical Considerations

Written informed consent was obtained from the patient for publishing the obtained data anonymously after the decision of the medical team to publish the TPM-based therapeutic process of the case.

Case Presentation

A 19-year-old female student with a history of atopy and documented nickel-induced ACD referred to the TPM department clinic of Qaem AJ Hospital affiliated to Mashhad University of Medical Sciences in Mashhad, Iran five weeks after the sudden onset of bolus and erythematous skin rash due to wearing a new wrist watch. The rash was initially located on the wrist and forearms and later spread to the entire body of the patient (mainly affecting both forearms and ears). The face, palms, soles, and tongue of the patient were unaffected. The rash

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was also accompanied by severe itching (Figure 1).

Before referral to the TPM clinic, the patient had undergone a four-week treatment course of avoiding contact with nickel and receiving valacyclovir, cephalexin, ethacridine lactate, triamcinolone, hydrocortisone, loratadine, adapalene, and fexofenadine. However, no satisfactory remission had been achieved. The patient had discontinued routine treatments for seven days before referral to the TPM clinic and did not accept continuing the routine treatments in the TPM-based treatment period.

Treatment was started with drinking a cup of steeped *Manna of Alhagi persarum (Taranjabin)* (5 gr) and *Portulaca oleracea (Khorfeh)* seeds (5 gr) twice a day. Two days after the onset of the treatment, the itching of the patient reduced significantly. The third visit of the patient was performed on the fifth day, with the patient stating that the itching had deteriorated, and the skin lesions had turned into dark, crusty patches (Figure 2).



Figure 1. Bolus and Erythematous Skin Rashes Focusing on Forearms of Reported Case



Figure 2. Dark Crusty Patches 5 Days after First Visit

Treatment continued with the prescription of similar doses for another week, and the patient was asked to avoid consuming tomato sauce, cocoa, coffee, and bitter chocolate. One week after the third visit, the severity and distribution of the skin lesions decreased, and the patient had complaints of no other complications than mild itching in the wrist (Figure 3).

The treatment resulted in the almost complete remission of the skin lesions and symptoms

within six weeks, and only mild pruritus remained in the patient's wrist (Figure 4).

The clinical follow-up of the patient after 12 months was normal. In addition, the patient **completed the prescriptions with no reports of adverse effects at the end of the study period.** Figure 5 depicts the timeline of the case study.



Figure 3. Improved Skin Lesions 12 Days after First Visit



Figure 4. Almost Complete Remission of Skin Lesions 38 Days after First Visit

Timeline

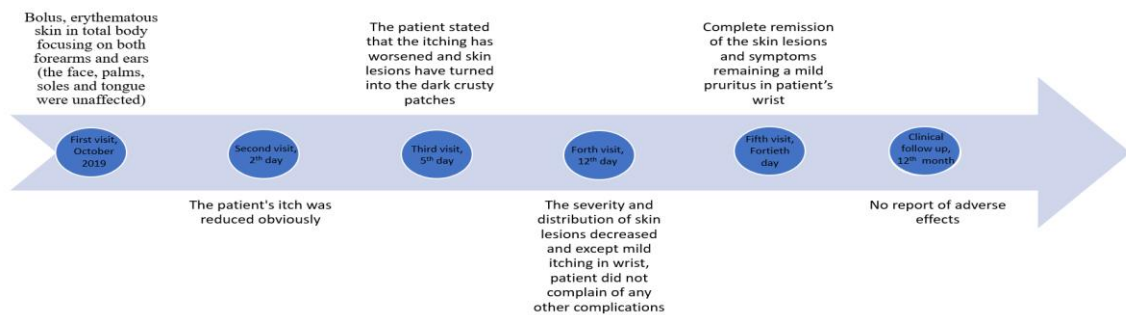


Figure 5. Timeline of Case Study

Discussion

Nickel-induced ACD is a common disorder affecting 28% of the Iranians experiencing allergies mostly in the case of young female patients. It is considered to be the most common ACD in Iran (3, 8, 9). Although allergen avoidance is the major preventive strategy against nickel-induced ACD, numerous patients opt for CAM strategies (especially the use of herbal medicines) for the management of acute flares. Although several studies have assessed the effectiveness of various medicinal plants such as *Impatiens biflora*, *Viola odorata*, *Althea officinalis*, and *Avena sativa* in the treatment of ACDs (9), few studies have investigated the effects of *Alhagi persarum* and *Portulaca oleracea* in this regard.

In the present study, no satisfactory remission occurred following the administration of valaciclovir, cephalexin, ethacridine lactate, triamcinolone, hydrocortisone, loratadine, adapalene, and fexofenadine and avoiding contact with nickel within a four-week treatment course. The TPM-based treatment was started seven days after the routine treatments had been discontinued by the patient, and she did not agree to continue the routine treatments during the TPM-based treatment course.

From the perspective of TPM, *Manna of Alhagi persarum* (*Taranjabin*) and *Portulaca oleracea* (*Khorfeh*) seeds have anti-inflammatory, wound-healing, and regenerative/moisturizing properties (10-12). These two therapeutic agents were primarily prescribed to our patient, and the observed effects could be attributed to their bioactive agents.

Portulaca oleracea exerts its effects through anti-inflammatory properties and balancing the adaptive and innate immune system depending on the conditions of the patient. *Portulaca oleracea* also acts as an immunomodulatory and antioxidant agent in both inflammatory states through dominating the Th2 response (e.g., asthma, cancer, atopic dermatitis) and evokes Th1 disorders such as hepatitis and multiple sclerosis (13). According to the literature, *Portulaca oleracea* contains omega-3 fatty acids, flavonoids, tannin, saponins, and terpenoids, which could suppress the inflammatory response pathways and reduce the inflammatory cytokines in the acute phase of nickel-induced ACD flare (12). Additionally, *Portulaca oleracea* may cool the skin-related temperament in

inflammatory lesions (14). The seeds of this plant are an abundant source of omega-3 fatty acids, which has been reported to play a pivotal role in controlling the symptoms of dermatitis (15). The activity of catecholamines such as dopamine and L-methyl-adrenalin, which are found in *Portulaca oleracea* seeds, could also explain the anti-allergic effects of this plant (16).

Previous findings have indicated that phenolic compounds have potent antipruritic effects (17). *Taranjabin* and *Khorfeh* are abundant sources of polyphenolic compounds, especially flavonoids (18). Other plants that have shown positive effects on ACD are also reported to be rich sources of polyphenols (19, 20). Therefore, it could be inferred that the improvement in the symptoms of our patient could be partly attributed to the activity of the polyphenolic compounds in the herbal medicines used in the treatment.

The macromolecules found in the water-soluble portion of *Alhagi persarum* may exert immunomodulatory effects (11). Polysaccharides, alkaloids, steroids, and flavonoids in *Alhagi persarum* are also considered to be the sources of the anti-inflammatory, antimicrobial, anti-ulcer, and analgesic effects of this plant, which could be highly effective in the treatment of dermatitis as well (21, 22).

The use of herbs in the treatment of ACD may be challenging. Some reports have indicated the induction of ACD by some plants or herbal preparations (23, 24). However, some patients may not respond to conventional treatments, and complementary or alternative therapies may be required in such cases. Basic studies, especially those examining the anti-inflammatory and anti-allergic effects of natural substances, could shed light on the choice of complementary therapies for these patients. Moreover, herbal treatments should be carefully monitored in terms of safety and their possible short-term/long-term complications.

The results of the present study indicated that the administration of two natural drugs for 40 days may significantly suppress the signs and symptoms of ACD. Furthermore, the one-year follow-up of the patients showed that the therapeutic effects of the treatment were not temporary, and no local or systemic side-effects were observed in the patient. Although increased pruritus was observed during the course of the

treatment, it could not be attributed to the treatment given the history of consuming spicy sauces by the patient and the control of itching when the consumption was discontinued. In addition to the clinical improvement of the disease symptoms, the treatment adherence of the patient was satisfactory.

The main limitation of this study was that the therapeutic effects of the two herbs were not investigated separately. Therefore, the obtained therapeutic outcomes cannot be attributed to one or both of the herbs. It is recommended that further investigations in this regard be focused on interventional factors such as the patient's diet although the dietary abstinence of the patients was noted in our study as well. Additional controlled studies are also essential to determining the exact role of these medicinal herbs as a potential option in the treatment of nickel-induced ACD.

Conclusion

According to the results, avoiding continuous contact with nickel and some allergenic foods and consuming *Manna of Alhagi persarum (Taranjabin)* and *Portulaca oleracea (Khorfeh)* seeds as the main therapeutic agents could be effective in the medical management of nickel-induced ACD. However, further studies are required to investigate the exact role of these medicinal herbs as potential treatment options for nickel-induced ACD.

Acknowledgements

Hereby, we extend our gratitude to our patient for her contribution to this research project.

Conflicts of Interest

None declared.

References

- Calzada D, Baos S, Cremades-Jimeno L, Cárdbaba B. Immunological mechanisms in allergic diseases and allergen tolerance: the role of treg cells. *J Immunol Res.* 2018;10.
- Saito M, Arakaki R, Yamada A, Tsunematsu T, Kudo Y, Ishimaru N. Molecular mechanisms of nickel allergy. *Int J Mol Sci.* 2016;17(2):202.
- Khatami A, Nassiri-Kashani M, Gorouhi F, Babakoohi S, Kazerouni-Timsar A, Davari P, et al. Allergic contact dermatitis to metal allergens in Iran. *Int J Dermatol.* 2013; 52(12):1513-8.
- Jacob SE, Goldenberg A, Pelletier JL, Fonacier LS, Usatine R, Silverberg N. Nickel allergy and our children's health: a review of indexed cases and a view of future prevention. *Pediatr Dermatol.* 2015; 32(6):779-85.
- Schäfer T. Complementary and alternative medicine (CAM) and atopic eczema. *Allergologie select.* 2017;1(1):44-52.
- Mahmoudpour Z, Shirafkan H, Mojahedi M, Gorji N, Mozaffarpur SA. Digesters in traditional Persian medicine. *Caspian J Intern Med.* 2018;9(1):1-6.
- Ali Reza Derakhshan RC, Sohrab Dehghan. A new look at epicardial adipose tissue from the perspective of Iranian traditional medicine. *J Integr Med.* 2014;12(6):529-30.
- Kashani MN, Gorouhi F, Behnia F, Nazemi MJ, Dowlati Y, Firooz A. Allergic contact dermatitis in Iran. *Contact dermatitis.* 2005;52(3):154-8.
- Nassiri-Kashani M, Nassiri-Kashani MH, Ghafari M. Evaluation of occupational allergic contact dermatitis and its related factors in Iran. *Med J Islam Repub Iran.* 2016;30:468.
- Ramezany F, Kiyani N, Khademizadeh M. Persian Manna in the past and the present: an overview. *Am J Pharmacol Sci.* 2013;1(3):35-7.
- Hamedi A, Farjadian S, Karami MR. Immunomodulatory properties of Taranjabin (Camel's Thorn) Manna and its isolated carbohydrate macromolecules. *Evid Based Complement Alternat Med.* 2015;20(4):269-74.
- Shenefelt PD. Herbal treatment for dermatologic disorders. In: Benzie IFF W-GS, editors. *Herbal Medicine: Biomolecular and Clinical Aspects.* 2nd edition. Boca Raton (FL): CRC Press/Taylor & Francis; 2011, Chapter 18.
- Rahimi VB, Ajam F, Rakhshandeh H, Askari VR. A pharmacological review on portulaca oleracea l.: focusing on anti-inflammatory, anti-oxidant, immunomodulatory and antitumor activities. *J Pharmacopunct.* 2019;22(1):7-15.
- Tabassum N, Hamdani M. Plants used to treat skin diseases. *Pharmacogn Rev.* 2014;8(15):52-60.
- Thomsen BJ, Chow EY, Sapijaszko MJ. The potential uses of omega-3 fatty acids in dermatology: a review. *J Cutan Med Surg.* 2020;24(5):481-94.
- Lymperopoulos A, Koch WJ. Chapter 9 - Autonomic Pharmacology. In: Waldman SA, Terzic A, Egan LJ, Elghozi J-L, Jahangir A, Kane GC, et al., editors. *Pharmacology and Therapeutics.* Philadelphia: W.B. Saunders; 2009. p. 115-39.
- Shohrati M, Davoud M, Rezazadeh S, Najafian B. Clinical efficacy of topical avena sativa versus betamethasone in chronic pruritus due to sulfur mustard exposure. *J Medicinal Plants.* 2017;16(63):68-77.
- Tavassoli AP, Anushiravani M, Hoseini SM, Nikakhtar Z, Baghdar HN, Ramezani M, et al. Phytochemistry and therapeutic effects of Alhagi spp. and tarangabin in the Traditional and modern medicine: a review. *J Herbmed Pharmacol.* 2020;9(2):86-104.
- Sur R, Nigam A, Grote D, Liebel F, Southall MD. Avenanthramides, polyphenols from oats, exhibit anti-

inflammatory and anti-itch activity. Arch Dermatol Res. 2008;300(10):569.

20. Sadighara P, Gharibi S, Moghadam Jafari A, Jahed Khaniki G, Salari S. The antioxidant and Flavonoids contents of Althaea officinalis L. flowers based on their color. Avicenna J Phytomedicine. 2012;2(3):113-7.

21. Asghari MH, Fallah M, Moloudizargari M, Mehdikhani F, Sepehrnia P, Moradi B. A systematic and mechanistic review on the phytopharmacological properties of alhagi species. Anc Sci Life. 2016;36(2):65-71.

22. Muhammad G, Hussain MA, Anwar F, Ashraf M, Gilani AH. Alhagi: a plant genus rich in bioactives for pharmaceuticals. Phytotherapy Research. 2015;29(1):1-13.

23. Baysak S, Gönül M, Atacan D, Ergin C. A case report of allergic contact dermatitis due to mandragora radix. Case Reports Immunol. 2015:591438.

24. Sen P, Ho MS, Ng SK, Yosipovitch G. Contact dermatitis: a common adverse reaction to topical traditional Chinese medicine. Int J Dermatol. 2010;49(11):1255-60.