

Pityriasis Folliculorum: Response to Topical Ivermectin

Kavita Darji BA and Nicole M. Burkemper MD
Saint Louis University School of Medicine, Saint Louis, MO

ABSTRACT

Pityriasis folliculorum has been described as a dry type of rosacea with extensive proliferation of *Demodex folliculorum* in pilosebaceous follicles of the skin. This skin condition is frequently difficult to manage, with various treatment options showing mixed efficacy. Oral ivermectin, a macrocyclic lactone parasiticide with anti-inflammatory and anti-parasitic effects, is one of the leading treatment modalities for demodicosis. Topical ivermectin has recently been FDA approved as therapy for rosacea. We present the case of a woman with pityriasis folliculorum who showed significant improvement from using topical ivermectin with no adverse events related to treatment.

J Drugs Dermatol. 2017;16(12):1290-1292.

INTRODUCTION

Pityriasis folliculorum, coined as rosacea-like demodicosis, is a dry type of rosacea with pathogenesis involving extensive infestation of *Demodex folliculorum*.^{1,7} *D. folliculorum* is an obligate parasite that resides within the hair follicles of the pilosebaceous glands of the skin, inhabiting 80%-100% of individuals over 50 years old.^{3-4,7} The clinical presentation involves generalized facial flushing and small sebaceous hair follicles plugged with dry, white scale, sometimes accompanied with visible pustular inflammation.^{1,6-9}

Although this skin condition is difficult to manage, treatment of choice for demodicosis is oral ivermectin, an acaricidal that has anti-inflammatory and anti-parasitic properties, with activity against endoparasites and ectoparasites such as *D. folliculorum*.^{7,10} Topical ivermectin 1% cream has recently been shown to be effective for treatment of rosacea.¹¹⁻¹³ Here we present the case of a woman with pityriasis folliculorum successfully treated with ivermectin 1% cream with no significant complications.

CASE REPORT

A 38-year-old woman presented to dermatology clinic with complaint of "rosacea" that she had had for 3 years. She described persistent redness of the central face and forehead with increased flushing from exercise and alcohol intake. She did not have any previous treatment. She used facial moisturizer and mild soaps, but no sunscreen. She had no known history of immunodeficiency.

Skin exam demonstrated diffuse facial erythema with follicular spicules, pink to red rough patches at the central face and forehead, and a single micropustule on the left cheek. A diagnosis of pityriasis folliculorum was given. Ivermectin 1% cream was prescribed, used as a thin film applied to the entire face daily. Daily sunscreen use with SPF 30 or higher was also recommended. Scraping was not done to detect *Demodex* mites.

At three-month follow up, the patient noted improved facial redness and endorsed great improvement of skin texture with the use of ivermectin 1% cream. Skin exam at this time revealed significant improvement of the rough skin texture and follicular spicules seen previously. Mild erythema was present on the cheeks, forehead, and nose. The cheeks were also notable for a few inflammatory pink papules consistent with papulopustular rosacea that had not been identified at initial presentation. Ivermectin 1% cream was refilled and Doxycycline 100 mg twice daily was added to the regimen to treat the papulopustular lesions. Pictures of pre- and post-treatment are not available.

DISCUSSION

Pityriasis folliculorum, later termed rosacea-like demodicosis by Ayres and Ayres, has been considered to be a dry type of rosacea manifesting with extensive proliferation of *Demodex folliculorum*.^{1,2} In a prior study, a single removed hair follicle showed a substantial number of *Demodex* mites in a patient with this skin condition.⁵ Other skin abnormalities that involve increased habitation by *Demodex* species when compared to control groups include blepharitis, pustular folliculitis, acne, perioral dermatitis, and demodicosis gravis.^{3-5,14-15} The degree of *Demodex* species infestation can contribute to the development of rosacea by initiating inflammation, inhibiting immune response, serving as an obstruction to hair follicles, and acting as a reservoir for bacterial accumulation.⁴ *Demodex* mites are most commonly located on the face in the vellus-sebaceous hair follicles, particularly the nose and temple.¹⁵

The typical appearance of pityriasis folliculorum is diffuse facial erythema with white-yellow minuscule, distinct scales of sebaceous hair follicles that are often plugged, with or without minimal inflammation often presenting as small superficial vesiculopustules.^{1,6-9} Associated symptoms often include pruritis and rough, sensitive skin.⁶ Other atypical presentations of *D. folliculorum* include acneiform lesions, or facial pruritis with

either facial erythema or pityriasisform squamous lesions.¹⁶ Individuals with both common rosacea and pityriasis folliculorum suffer from similar symptoms, including facial pruritis, flushing, pustules, and blepharitis.³ However, rough surface of the skin, often described as “sandpaper-like”, differentiates pityriasis folliculorum from common rosacea.³ Moreover, common rosacea manifests more often with oily skin, without follicular scaling, and occurs deeper in the skin.^{3,17}

There are various treatment options for human demodicosis (including pityriasis folliculorum), but overall this condition can be challenging to treat due to extensive survival of *Demodex* mites from a possible localized or systemic immune deficiency associated with pityriasis folliculorum, as evidenced by prior literature.^{9,18} Preferred therapy is ivermectin (200 µg/kg single dose), often used with topical metronidazole 1% gel, permethrin 5% cream, or benzyl benzoate.^{7,10} Ivermectin, a macrolide endectocide and an anaricidal, has both anti-inflammatory and anti-parasitic characteristics with efficacy against both endoparasites with cutaneous tropism and ectoparasites, such as *D. folliculorum*.¹⁴ A prior study showed improved appearance of demodicosis lesions within 3 months with a single dose of oral ivermectin 200 µg/kg and topical permethrin 5% lotion administered for 3 consecutive nights, with oral ivermectin repeated weekly for 10 weeks in addition to oral erythromycin and topical metronidazole cream.¹⁰ Additionally, significant response to treatment with oral ivermectin and 5% permethrin cream for *Demodex* infection was seen in an HIV positive male.¹⁹ Similarly, the combination of oral ivermectin (4 doses over 6 weeks) and topical permethrin resulted in extensive resolution of severe demodicosis located on the face within 3 months in a child with leukemia.¹⁵ Eucalyptus globulus, or camphor oil, with or without glycerol dilutions at concentrations of at least 50%, provided complete resolution, with no side effects.^{14,20} Although treatment with steroids may initially show improvement, long-term use exacerbates demodicosis lesions.¹⁵

Ivermectin in its topical form has demonstrated efficacy in treating rosacea and was recently FDA approved for treatment of papulopustular rosacea.^{11,21-22} Ivermectin 1% cream is used topically once daily on regions of the face and neck containing rosacea lesions, and has minimal (<2%) incidence of adverse effects.²³ Two prior clinical trials showed efficacy of ivermectin 1% cream in treating rosacea patients with decreased counts of inflammatory lesions, higher percentage of lesion categorization as “clear” or “almost clear” according to Investigator Global Assessment, and increased patient-reported outcomes of lesion improvement when compared to control patients who received the vehicle cream.¹¹⁻¹³ Once-daily topical use of ivermectin 1% cream has displayed greater efficacy than twice-daily metronidazole 0.75% when treating rosacea, also measured using these same parameters.²⁴ The positive response of pityriasis folliculorum to treatment with ivermectin 1% cream can

be similarly measured by lesion reduction and patient satisfaction in our patient. Ivermectin therapy eliminated the rough red patches and “sand-paper like” texture in our patient, who herself reported improved skin lesions and was pleased with the outcome of therapy.

To our knowledge, this is the first reported case of the use of ivermectin 1% cream for pityriasis folliculorum. As indicated by the reduced severity of skin abnormalities associated with this condition and patient contentment noted in this case, topical ivermectin 1% cream may be used for successful management of pityriasis folliculorum. Given that this condition can be very difficult to treat, having another treatment option could lead to improved control of this disease and better patient outcomes.

DISCLOSURES

The authors have no conflict of interests to declare.

REFERENCES

1. Ayres S, Ayres S Jr. Demodectic eruptions (demodicidosis) in the human. 30 years' experience with 2 commonly unrecognized entities: pityriasis folliculorum (*Demodex*) and acne rosacea (*Demodex* type). *Arch Dermatol.* 1961;83:816-27.
2. Ayers S Jr, Mihan R, Marks R, Harcourt-Webster JN. Demodex folliculorum in rosacea. *Arch Dermatol.* 1970;101(6):706-7.
3. Tinklepaugh AJ, Wilson BB. Pityriasis folliculorum: A novel therapy for a diagnostically challenging condition. *J Am Acad Dermatol.* 2013;69:276-277.
4. Zhao YE, Wu LP, Peng Y et al. Retrospective Analysis of the Association Between *Demodex* Infestation and Rosacea. *Arch Dermatol.* 2010;146(8):896-902.
5. Hsu CK, Hsu MML, Lee JYY. Demodicosis: a clinicopathological study. *J Am Acad Dermatol.* 2009;60(3):453-462.
6. Yuan C, Wang XM, Guichard A et al. Comparison of reflectance confocal microscopy and standardized skin surface biopsy for three different lesions in a pityriasis folliculorum patient. *Br J Dermatol.* 2015; 172(5): 1440-2.
7. Chen W, Plewig G. Human demodicosis: revisit and a proposed classification. *Br J Dermatol.* 2014;170(6):1219-25.
8. Dominey A, Tschen J, Rosen T et al. Pityriasis folliculorum revisited. *J Am Acad Dermatol.* 1989;21(1):81-4.
9. Forton FM. Papulopustular rosacea, skin immunity and *Demodex*: pityriasis folliculorum as a missing link. *J Eur Acad Dermatol Venerol.* 2012 Jan;26(1):19-28.
10. Guerrero-Gonzalez GA, Herz-Ruelas ME, Gomez-Flores M et al. Crusted Demodicosis in an Immunocompetent Pediatric Patient. *Case Rep Dermatol Med.* 2014;2014: 458046.
11. Raedler L. Soolantra (Ivermectin) 1% Cream: A Novel, Antibiotic-Free Agent Approved for the Treatment of Patients with Rosacea. *Am Health Drug Benefits.* 2015;8(Spec Feature): 122-125.
12. Stein GL, Kircik L, Fowler J et al. Efficacy and safety of ivermectin 1% cream in treatment of papulopustular rosacea: results of two randomized, double-blind, vehicle-controlled pivotal studies. *J Drugs Dermatol.* 2014;13:316-323.
13. Soolantra (ivermectin) cream, 1%, for topical use [prescribing information]. Fort Worth, TX: Galderma Laboratories, LP; December 2014.
14. Fichtel JC, Wiggins AK, Leshner JL. Plaque-forming demodicidosis. *J Am Acad Dermatol.* 2005;52(2 Suppl 1):59-61.
15. Damian D, Rogers M. *Demodex* infestation in a child with leukaemia: treatment with ivermectin and permethrin. *Int J Dermatol.* 2003;42(9):724-6.
16. Karingooglu Y, Bayram N, Aycan O et al. The clinical importance of demodex folliculorum presenting with nonspecific facial signs and symptoms. *J Dermatol.* 2004; 31(8):618-26.
17. Hasan M, Siddiqui FA, Naim M. Human demodicidosis. *Ann Trop Med Public Health.* 2008;1:70-1.
18. Jarmuda S, O'Reilly N, Zaba R, Jakubowicz O et al. Potential role of *Demodex* mites and bacteria in the induction of rosacea. *J Med Microbiol.* 2012;61(Pt 11):1504-10.
19. Aquilina C, Viraben R, Sire S. Ivermectin-responsive *Demodex* infestation during human immunodeficiency virus infection. A case report and literature review. *Dermatol.* 2002;205(4):394-7.

20. Morsy TA, Morsy GH, Sanad EM. Eucalyptus globulus (camphor oil) in the treatment of human demodicidosis. *J Egypt Soc Parasitol.* 2002;32(3):797-803.
21. Gupta G, Daigle D, Gupta AK et al. Ivermectin 1% cream for rosacea. *Skin therapy Lett.* 2015;20(4):9-11.
22. Dourmishev AL, Dourmishev LA, Schwartz RA. Ivermectin: pharmacology and application in dermatology. *Int J Dermatol.* 2005;44(12):981-8.
23. Deeks Ed. Ivermectin: A Review in Rosacea. *Am J Clin Dermatol.* 2015;16(5):447-52.
24. Taieb A, Ortonne JP, Ruzicka T et al. Superiority of ivermectin 1% cream over metronidazole 0.75% cream in treating inflammatory lesions of rosacea: a randomized, investigator-blinded trial. *Br J Dermatol.* 2015;172(4):1103-10.

AUTHOR CORRESPONDENCE

Nicole M. Burkemper MD

E-mail:..... nburkem2@slu.edu