

## Wolf's isotopic response

Heena Singdia<sup>1</sup>, Rohit Garg<sup>2</sup>, Sinni Jain<sup>3</sup>, Vijay Paliwal<sup>4</sup>, Puneet Bhargava<sup>5</sup>,  
Deepak Mathur<sup>6</sup>

<sup>1,2,3,4,5,6</sup>(Department of dermatology, venereology and leprology, SMS Medical College, India)

Corresponding Author: Heena Singdia

---

**Abstract:** We report a case of 36 year old Hindu female who initially presented with the diagnosis of *Tinea corporis* two months back and was treated with oral and topical antifungals, later on lichenoid plaques were observed at the healed sites of the previous infection. This phenomenon is "Wolf's isotopic response" described as the occurrence of a new skin disorder at the site of another unrelated and already healed skin disease. There are few related cases of lichen planus presenting as isotopic response. The pathogenesis of this phenomenon is still unknown and further studies are needed

**Key words:** Isotopic response of Wolf.

**Key message:** Wolf's isotopic response is a rare entity involving the same site as that of initial disease with same pathophysiology.

---

Date of Submission: 05-01-2019

Date of acceptance: 21-01-2019

---

### I. Introduction

Described by Wolf et al in 1995, Wolf's isotopic response occurs when a dermatosis appears in a region previously affected by another unrelated and already healed skin disease.<sup>[1]</sup> This differs the Koebner Phenomenon or an isomorphic response, which is the development of the same disease at a site of damaged or traumatized skin. Only a few isolated case reports have been published demonstrating Wolf isotopic response because of difficulty in recognition of the occurrence of this phenomenon.

### II. Case Report

A 36 year old female presented with multiple well defined hyperpigmented annular plaques of size 10-15 cm in diameter with overlying fine scaling at forearm and dorsal aspect of right wrist associated with itching. After KOH Mount the plaque was diagnosed to be of *Tinea corporis*, for which the patient was treated with oral and topical antifungals for two months.

On 4th follow up visit the previous lesions had disappeared leaving behind slight hyperpigmentation. However multiple well-ill defined violaceous lichenoid plaques of size 3-5 cm in diameter with white striae on surface started developing on the previously healed site ( image 1,2).

Skin biopsy was performed which showed epidermis with hyperkeratosis, mild increase in the granular layer, acanthotic areas interspersed with atrophic areas, foci of degeneration in the basal layer, subepidermal cleft (Max Joseph space), Civatte bodies, mild lymphohistiocytic infiltrate in the superficial dermis.

Clinical and histopathological findings helped to diagnose Lichen Planus which developed at the healed site of *Tinea corporis* plaques. These findings confirm the occurrence of Isotopic phenomenon of Wolf.

### III. Discussion

Although the phenomenon of the occurrence of a new skin disease at the site of another skin disease that had already healed had already been described long ago in 1955 by Wyburn-Mason.<sup>[2]</sup> It was only in 1985 that the Wolf and Wolf gave it a term; "isoloci response" first which was modified to "isotopic response" (same place) by Wolf et al., and finally reframed as Wolf's isotopic response by Ruocco et al.<sup>[3]</sup>

Various dermatoses present as a consequence of isotopic response such as granulomatous reactions, malignant tumors, leukemic infiltrates, dermatoses secondary to immunologic dysfunction, infections, comedonic reactions, and other miscellaneous conditions.

Isotopic response however differs from isomorphic response which was described by Heinrich Koebner, in 1872, as the phenomenon where in typical skin lesions of an existing dermatosis appeared at sites of injuries.<sup>[4]</sup> This was termed as "isomorphic response of Koebner" classically seen in psoriasis, lichen planus, and vitiligo. Difference being the presence of lesions of same morphology at the site of injury in Koebner's phenomenon, whereas in Wolf's isotopic response appearance of a new lesion (i.e. of different morphology) but at the same site of previously healed lesion.

Interval between initial infection and the development of secondary disease varies widely, from days to years, Jaka-Moreno et al found this duration to be from 15 days to 7 months.<sup>[5]</sup>

The pathophysiology although is not clear but is somewhat explained by the concept that the healed skin may continue to show microscopic and physiologic changes for a long time after the initial insult and some of these changes may in fact be responsible for occurrence of new dermatosis.

Different theories for the pathogenesis being proposed include the imbalance between the pro- and antiinflammatory peptides determine the occurrence of a new dermatosis. Alteration in the local vasculature at diseased site may provide a favorable environment for localization of immune cells and upregulation of adhesion molecules. Cutaneous immunomodulation (primarily immunosuppression) occurs due to their effect on T regulatory cells. There is increase in population of dermal CD4+ and CD8+ T cells with infiltration of epidermis with CD8+ T cells resulting in keratinocyte necrosis.<sup>[6]</sup>

#### **IV. Conclusion**

In wolf's isotopic response the new disease follows the healed site of the previous disease, timely recognition of isotopic phenomenon helps in planning the new line of treatment to dermatologists.

#### **V. Declaration Of Patient Consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

#### **SOURCE OF FINANCIAL SUPPORT AND SPONSORSHIP**

Nil.

#### **CONFLICT OF INTEREST**

Nil

#### **Acknowledgement**

Nil.

#### **References**

- [1]. Wolf R, Brenner S, Ruocco V, Filioli FG. Isotopic Response. *Int J Dermatol.* 1995;34:341-8.
- [2]. Wyburn-Mason R. Malignant change arising in tissues affected by herpes. *BMJ* 1955;2:1106-9.
- [3]. Wolf R, Brenner S, Ruocco V, Filioli FG. Isotopic response. *Int J Dermatol* 1995;34:341-8.
- [4]. Boyd AS, Neldner KH. The isomorphic response of Koebner. *Int J Dermatol* 1990;29:401-10.
- [5]. Jaka-Moreno A, López-Pestaña A, López-Núñez M, Ormaechea-Pérez N, Vildosola-Esturo S, Tuneu-Valls A, et al. Wolf's isotopic response: a series of 9 cases. *Actas Dermosifiliogr.* 2012;103:798-805.
- [6]. Serfling U, Penneys NS, Zhu WY, Sisto M, Leonardi S. *J Cutan Pathol* 1993;20:28-33.

Heena Singdia, "Wolf's isotopic response." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, vol. 18, no. 1, 2019, pp 59-60.