

Tinea Confined to Tattoo Sites - An Example of Ruocco's Immunocompromised District

Dear Editor,

The authors should be complimented for documenting their first Indian case series of four patients showing the unusual phenomenon of superficial dermatophytosis (tinea) restricted to tattooed sites.^[1] They have ruled out the possibility of direct inoculation of the fungus into the tattooed area during or immediately following tattooing, considering that all their four cases developed the infection after 2 months of tattooing procedure, whereas the incubation period of tinea is only 4-10 days. They also cite some interesting articles that observed molluscum contagiosum and verrucae preferentially appearing in black tattoos and allude to the possibility of black tattoo ink diminishing cellular as well as humoral immunity.^[2-4] They have substantiated the hypothesis of the immunosuppressive effect of the black ink having a putative role in their cases of tinea at the tattoo sites, although without an explanation which would have indeed been useful at this juncture. Black ink is composed primarily of nanoparticles and contains polycyclic aromatic hydrocarbons (PAH) that are well established environmental pollutants. They produce reactive oxygen species, known to damage components of the cell by membrane lipid oxidation following exposure to ultraviolet light. Nanoparticles are known to produce more ROS than larger ones.^[5] Carbon black, another PAH often found in black ink is known to be proinflammatory and mutagenic even at subcytotoxic levels by producing ROS.^[5] However, in addition to the role of black ink which at best remains a hypothesis, it is pertinent on two counts to explain the phenomenon by revisiting the fascinating concept of 'immunocompromised district' (ICD) first described in 2009 by Ruocco *et al.* and later modified to provide even a larger umbrella for various dysimmune reactions.^{6,7}

ICD is a sectorial aberration in immune control of skin that has been damaged due to various causes, including all sorts of trauma, long-standing lymphatic stasis, herpetic infections and so on. The concept of ICD is an attempt to bring a semblance of uniformity to various situations such as infections, tumors, and immune reactions that may develop over such a site.^[6,7] The case series of tinea limited to black tattoo sites described by Panda *et al.* are classic examples of "ICDs" on two counts.^[1] The black ink, as well as the micro trauma induced by tattoo needles, both, can contribute to local dysimmune reactions, thereby leading to the development of an "immunocompromised district" in which fungal and viral infections such as tinea, verrucae, or molluscum contagiosum can develop.^[5-7] Such secondary phenomena occurring in these immunocompromised districts are seen even after months or years.^[7]

In this current epidemic like scenario of dermatophytosis, dermatologists are seeing not only a dramatically high number of patients of tinea but are also encountering unusual, at times bizarre, morphology, locations as well as circumstances under which the infection has been acquired.^[8,9]

A majority of patients abuse creams containing antifungals, potent steroids, and antibacterial agents for varying periods of time, which are known to reduce local immunity.^[8-10] It would be worthwhile exploring the possibility of steroid creams adding to the sectorial dysimmune reactions. Further, reporting of more such cases would add to the corpus of knowledge regarding the growing number of cases of tinea, which we encounter in immunocompromised cutaneous districts.

Letter to the Editor in response to Panda M, Patro N, Raj C, Pattnaik M. Tinea lesions confined to tattoo site. *Indian Dermatol Online J* 2019;10:474-5.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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Access this article online	
Website: www.idoj.in	Quick Response Code 
DOI: 10.4103/idoj.IDOJ_343_19	

How to cite this article: Verma SB. Tinea confined to tattoo sites - An example of Ruocco's immunocompromised district. Indian Dermatol Online J 2019;10:739-40.

Received: July, 2019. **Accepted:** September, 2019.

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