

# Minocycline-induced hyperpigmentation in a patient with prurigo pigmentosa

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Accepted 6 June 2021

## DESCRIPTION

An 87-year-old woman with nephrosclerosis presented with blue-grey pigmentation of her lower limbs (figure 1). She had been diagnosed with nephrosclerosis at the age of 82 years because of a history of hypertension for more than 8 years, normal urinalysis and renal atrophy on CT. She denied malaise, bruises or a family history of hyperpigmentation. On the physical examination, the ulnar surfaces of her legs had blue-grey pigmentation bilaterally, which was more on the right leg (figure 2). However, the face, sclera, teeth, trunk, upper limbs or nails showed no evidence of pigmentation. Laboratory investigation showed an elevated creatinine level at 3.52 mg/dL, but liver function was normal. For 4 months, she had been administered minocycline 100 mg orally two times per day for prurigo pigmentosa. Therefore, She was diagnosed with minocycline-induced hyperpigmentation.

There are four types of minocycline-induced hyperpigmentation. Type I involves blue-black macules on the face at the site of scarring and previous inflammation. Type I is the most common. It results from local pigment deposition by iron chelates of minocycline, regardless of the dose and duration of minocycline. Type II occurs on the normal skin of the extremities, presenting as blue-grey pigmentation. Type II depends on the duration of minocycline treatment, because it is caused by quinone metabolites of minocycline. Type III is the least common, presenting as a diffuse muddy-brown discolouration on sun-exposed skin. In type III, minocycline induced melanin synthesis in epidermal melanocytes, which was intensified by ultraviolet irradiation.<sup>1</sup> Type IV is associated with the same cause as that of type III, but occurs on preexisting scarring.<sup>2</sup> Based on the prolonged minocycline treatment and distribution of the blue-grey pigmentation, this patient had type II pigmentation.

The differential diagnoses of hyperpigmentation are Addison's disease, haemochromatosis, skin tumour, melasma and medications. Drug-induced hyperpigmentation accounts for 1.31% in patients attending a dermatology consultation.<sup>3</sup> Minocycline is easier to prescribe among the tetracycline group because it is not thought to be accumulated in patients with impaired kidney function. Another advantage of minocycline is that it has the non-antibiotic properties including anti-inflammatory and antiapoptotic effects. For instance, minocycline controlled the



Figure 1 Blue-grey pigmentation on the front view.

inflammation by reducing the protease-activated receptor 2-mediated production of interleukin-8 in epidermal keratinocytes.<sup>4</sup> Therapeutic option may be laser treatment.<sup>5</sup> However, hyperpigmentation persists for months to years or indefinitely after minocycline discontinuation. Therefore, careful follow-up and timely recognition of pigmentation are required in patients receiving minocycline.



Figure 2 Blue-grey pigmentation of the right leg on the lateral view.



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To cite: Yamamoto N, Dejima A, Hasatani K. *BMJ Case Rep* 2021;**14**:e244365. doi:10.1136/bcr-2021-244365

## Learning points

- ▶ Minocycline can cause hyperpigmentation.
- ▶ Careful follow-up and timely recognition is the key because minocycline-induced hyperpigmentation may persist indefinitely.

**Contributors** NY and AD made substantial contributions to conception and design and have been involved in drafting the manuscript. KH approved the final version to be published.

**Funding** The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

**Competing interests** None declared.

**Patient consent for publication** Obtained.

**Provenance and peer review** Not commissioned; externally peer reviewed.

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#### REFERENCES

- 1 Rok J, Rzepka Z, Kowalska J, *et al*. Molecular and biochemical basis of minocycline-induced Hyperpigmentation-The study on normal human melanocytes exposed to UVA and UVB radiation. *Int J Mol Sci* 2021;22:3755.
- 2 Mouton RW, Jordaan HF, Schneider JW. A new type of minocycline-induced cutaneous hyperpigmentation. *Clin Exp Dermatol* 2004;29:8–14.
- 3 Giménez García RM, Carrasco Molina S. Drug-Induced hyperpigmentation: review and case series. *J Am Board Fam Med* 2019;32:628–38.
- 4 Garrido-Mesa N, Zarzuelo A, Gálvez J. Minocycline: far beyond an antibiotic. *Br J Pharmacol* 2013;169:337–52.
- 5 Sasaki K, Ohshiro T, Ohshiro T, *et al*. Type 2 Minocycline-induced hyperpigmentation successfully treated with the novel 755 nm picosecond alexandrite laser - a case report. *Laser Ther* 2017;26:137–44.

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