

# Levofloxacin-induced black hairy tongue (BHT) in a 30-year-old female COVID-19 infected patient

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## To the Editors,

Black hairy tongue (BHT) is a condition in which the filiform papillae on the dorsal surface of the tongue are elongated and hypertrophied [1–3]. The tongue is hairy and discolored, the color is usually black, but brown, green, or yellow appearances have been reported. Patients with this condition are either asymptomatic or they rarely mention a burning sensation of the tongue or halitosis. Similar conditions that mimicking BHT should be ruled out are acanthosis nigricans, hairy leukoplakia, and melanocytic nevi. Xerostomia, smoking, coffee, poor oral hygiene and use of medication are risk factors for acquiring BHT [4]. Black hairy tongue is also associated with various conditions that cause immune compromise, such as malignancies, human immunodeficiency virus (HIV), graft versus host disease (GVHD) and recent radiation therapy to the head and neck region [3, 4]. A lot of medications [5] have been reported to induce hairy discoloration of the tongue like antibiotics, proton pump inhibitors, antipsychotics, chemotherapeutic drugs, methylodopa, and interferon. Macrolides, linezolid [6], tetracyclines, penicillins, cephalosporins, and metronidazole are among the anti-infective agents that are mainly involved in this condition. The association between microbial infections and development of BHT has been debated for many years and it seems that bacterial proliferation is secondary to antibiotic use, as well as the elongation of the filiform papillae. The alteration of the oral microflora gives rise to resistant bacteria and fungi

[7], which are trapped and proliferate in the filiform papillae. Fungi such as *Candida* and *Aspergillus* are thought to aggravate the condition [8].

We report a 30-year-old female who presented with a history of fever, cough, and myalgias. After ordering blood tests, a chest X-ray and taking a nasopharyngeal swab specimen for a SARS-CoV-2 reverse transcription-polymerase chain reaction (RT-PCR) test, the patient received levofloxacin. The test was positive; the patient self-isolated at home and was treated as an outpatient with levofloxacin, paracetamol, and oral fluids. The symptoms resolved without major complications like dyspnea or hypoxemia. Oxygen saturation was self-monitored daily and she was in continuous communication with her treating physician. She was prescribed levofloxacin for seven days. On the fifth day she complained about a burning sensation on the dorsal surface of the tongue and noticed black discoloration of her tongue. The physician examined the patient using personal protective equipment and collected a sample from the affected area, which was sent for culture as a specimen from the tongue (Figure 1). The specimen was negative for bacteria and yeast. Levofloxacin was stopped after seven days and patient's condition gradually improved. Tongue appearance on day 13 was normal without discoloration and burning sensation resolved.

Black hairy tongue is a self-limiting, usually asymptomatic condition which resolves after withdrawing the considered causative agent and performing oral hygiene. Discoloration of the tongue is accompanied by elongated filiform papillae (12–18 mm) along with hypertrophy (2 mm width). Antibiotics can change the

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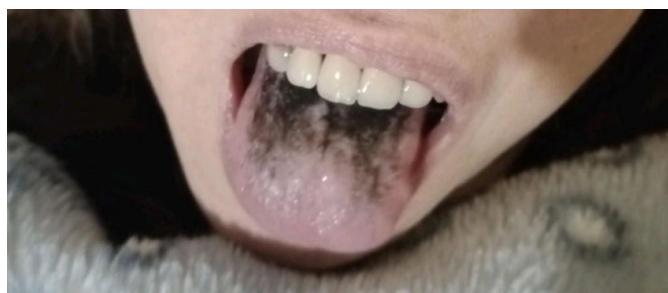


Figure 1: Black haired tongue during treatment with levofloxacin 500 mg once daily.

mouth flora and chromogenic bacteria contribute to tongue discoloration. Moreover, the use of antimicrobial agents can lead to inadequate desquamation and hairy elongation—hypertrophy of the filiform papillae. Amatus Lusitanus first described this disease in 1557. Multiple factors can contribute to this condition, but the pathophysiology is not yet fully understood. Clinical examination alone is sufficient for the diagnosis of BHT, while biopsy of the affected tissue is not required.

We report in this letter the first COVID-19 positive patient who developed levofloxacin-induced BHT. After conducting a literature search using Pubmed, we noticed only one case report [9] in which a patient acquired BHT during treatment with Piperacillin/Tazobactam and levofloxacin due to multidrug resistant (MDR) *Pseudomonas aeruginosa*. The main oral manifestation of COVID-19 is gustatory impairment, however, various oral mucosal lesions such as, ulcers, erosions, plaques, macules, and geographical tongue, varying in size, color, and appearance have been described [10]. Clinicians should be aware about this benign condition which requires only visual inspection and often follows antibiotic administration, of equal importance is patient education about this condition, as it is an unusual one, and it may be erroneously attributed to a malignancy. This tongue disease is self-limiting, does not require antifungal therapy, and is resolved after discontinuation of the causative agent, while improving oral hygiene.

**Keywords:** Black hairy tongue (BHT), COVID-19, Levofloxacin

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Author Contributions

Maria Tzikopoulou – Conception of the work, Design of the work, Drafting the work, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Evangelos Potolidis – Conception of the work, Design of the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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Guarantor of Submission

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**Consent Statement**

Written informed consent was obtained from the patient for publication of this article.

**Conflict of Interest**

Authors declare no conflict of interest.

**Data Availability**

All relevant data are within the paper and its Supporting Information files.

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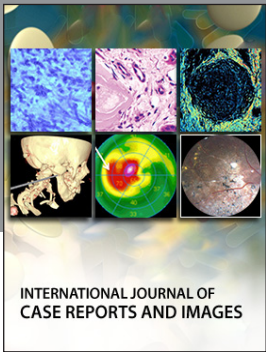
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