Review Article

FUTURE JOURNAL OF PHARMACEUTICALS AND HEALTH SCIENCES

Published by Pharma Springs Publication Journal Home Page: https://pharmasprings.com/fjphs

A review on the case report of significant effects of antibiotics-induced lingua villosa nigra

Dr Salma Shaik*[1], P. Chamundeswari[2], J. Jyothi[2], S. Jyosthna[2], T. Rathna kumari[2], Dr. S Nivedhitha[3]

[1]Department of Pharmacy Practice, Swathi College of Pharmacy Near Toll Plaza, Venkatachalam Mandal Nellore Dist. 524320.

[2]Swathi College of Pharmacy Near Toll Plaza, Venkatachalam Mandal Nellore Dist. 524320.

[3]Department of Pharmacognosy, Swathi College of Pharmacy Near Toll Plaza, Venkatachalam Mandal Nellore Dist. 524320.

Article History:

Received on: 16 Aug 2024
Revised on: 20 Sep 2024
Accepted on: 23 Sep 2024

Keywords:

Antibiotics,
Ulcerations,
Black hairy tongue,
Perirenal abscess.

Abstract

Antibiotics are commonly used to treat various bacterial and fungal infections. While effective, prolonged antibiotic use can lead to side effects, such as gastrointestinal ulcerations affecting the stomach, small intestine, and large intestine. Rarely, unusual reactions like "black hairy tongue" can occur. This condition results from the overgrowth of papillae on the tongue's surface, giving it a dark, furry appearance.Here, we present a case involving a female patient with Type II diabetes mellitus and a perirenal abscess who developed black hairy tongue as a rare side effect of extended antibiotic use. Her diabetes and infection complicated both the management of her primary condition and her antibiotic treatment. This case study explores the onset of this adverse reaction, its impact on the patient, and the duration of her recovery. Additionally, we will discuss the preventive measures taken to treat the condition and outline strategies to prevent similar complications in future antibiotic therapies.

∗Corresponding Author
Name: Dr Salma Shaik
Phone: +91 9989818856
Email: syedabusalma.shaik@gmail.com

eISSN: 2583-116X
DOI: https://doi.org/10.26452/fjphs.v4i4.657

Production and hosted by
Pharmasprings.com

INTRODUCTION

The filiform papillae on the tongue's dorsal surface exhibit hypertrophy, hyperkeratosis, elongation, and a hairy, carpet-like appearance in the benign acquired lesion known as black hairy tongue (lingua villosa nigra). With some regional variations, its prevalence in the population ranges from 0.6 to 13%. Patients typically present to the doctor with concerns about appearance and appearance-related issues, and it is often asymptomatic [1].The etiology of this disease has been linked to smoking, alcohol intake, excessive tea and coffee drinking, drug use, and poor dental hygiene. Antacids, lithium, lansoprazole, and some

antibiotics are among the drugs linked to this condition. The antibiotics most frequently related to this condition are erythromycin, penicillins, doxycycline, linezolid, and neomycin. The diagnosis is made based on the observation of colored filiform papillae on inspection; a biopsy is usually not necessary. The differential diagnosis includes agents that cause black tongue, oral hairy leukoplakia, acanthosis nigricans, congenital lingual melanotic macules, congenital melanocytic nevus, premalignant leukoplakia, squamous cell carcinoma, and hypertrophic herpes virus infection [2].The recommended course of treatment for patients is tongue brushing, oral nystatin, retinoids, and B-complex vitamins. A black hairy tongue produced by drugs is an uncommon medical disease that develops after antibiotics. On the tongue's dorsum, it appears as a stygian hairy look. Generally speaking, a lack of either vitamin B3 or niacin is the cause of black hairy tongue (BHT). Excessive intake of tea, alcohol, caffeine, and some antibiotics may be the leading cause of black tongue [3].

EPIDEMIOLOGY:

Turkish dental outpatients participated in a significant cross-sectional study that revealed an overall prevalence of 11.3%, with higher rates among men (18%) than women (6%). However, a cross-sectional survey of 1901 Iranian dental patients only found a 1.2% prevalence. BHT was found in 8.4% of patients in a young Finnish population, compared to 0.6% of school-age children in Minnesota. Differences in patient demographics (age, sex, ethnicity, practices, and habits) and interobserver variability in defining lesions in matching study populations may cause discrepancies in the observed rates [4].

ANATOMY AND PATHOPHYSIOLOGY

The tongue is an oropharyngeal organ that is highly muscular. It comprises an inferior surface, a curved dorsum, an apex, and a root. The pharyngeal plexus minimizes the innervation of the tongue muscles, primarily supplied by the hypoglossal nerve. Two nerves are responsible for the tongue's somatosensory innervation. The anterior two-thirds of the tongue is innervated by the lingual branch of the mandibular division of the trigeminal nerve, whereas the glossopharyngeal nerve innervates the posterior third. Lastly, the lingual artery and branches supply most of the tongue with blood. BHT usually affects the dorsum of the tongue, which is separated by the V-shaped sulcus terminalis into the oral (presulcal) and pharyngeal (postsulcal) halves [5]. Fully keratinized epithelium is located anteriorly, whereas non-keratinized stratified squamous epithelium is located posteriorly, lining the dorsal epithelium. There is no submucosa in between the dorsal mucosa and the underlying muscle. The dense, fibrous connective tissue comprising the underlying lamina propria is home to many arteries and nerves supplying the papillae. The dorsal mucosa protrusions on the sulcal region of the tongue are called lingual papillae. Filiform, fungiform, foliate, and circumvallate papillae are the primary forms of lingual papillae. Most of the presulcal dorsal tongue is covered in dense filiform papillae, primarily impacted in BHT. These are tiny cylinder-shaped or conical protrusions with a central body encircled by several thread-like cornified projections known as secondary papillae. They transport food particles within the oral cavity and increase friction between the tongue and food.

BHT's pathogenesis is still not entirely understood. It is believed to result from improper tongue dorsal surface desquamation [6]. Consequently, regular debridement is hindered, which causes keratinized layers to accumulate. The filiform papillae that develop from this hypertrophy and elongation superficially resemble hairs. The elongated papillae are typically less than 1 mm long but can grow up to 12–18 mm long and 2 mm wide. After that, these primarily gather bacteria, fungi, and detritus. Chromogenic organisms cause the lesion's distinctive color in the oral flora, which produces porphyrins and residue from tobacco, coffee, tea, and other meals. The "hairs," which are highly elongated cornified spines formed by the delayed desquamation of cells in the middle column of filiform papillae and the notable preservation of secondary papillary cells that produced hair-type keratins, are detected using antikeratin probes on BHT epithelium [7].

ETIOLOGY:

As a result of a mix of systemic and local abuse, the etiology of BHT is yet unknown, but it is probably complex. The varying palette look of the hairy tongue is probably caused by variations in the intrinsic (chromogenic oral microbiota) and

extrinsic (environmental) factors that may contribute. An estimated 58% of men and 33% of women smoke heavily, even though casual smoking has a slightly higher risk of BHT than non-smoking (15% to 10% in men and 5.5% to 5.2% in women).

Much to smoking, consuming large amounts of black tea causes BHT to be more common in patients, both male and female. Important risk factors that predispose some people to develop BHT include the use of alcohol and intravenous drugs, heavy coffee consumption, poor dental hygiene, general debilitation, and recent radiation therapy to the head and neck region [8]. BHT development has also been linked to extended usage of oxidizing mouthwashes that contain hydrogen peroxide, sodium peroxide, and sodium perborate. Consuming sugars and herbal teas through diet may cause the pH of the tongue's dorsum to drop, encouraging the growth of chromogenic bacteria.

As a cutaneous manifestation of graft-versus-host disease, several cases of BHT following allogenic stem-cell transplantation have been documented most recently. Finally, one study found that the prevalence of BHT is higher in malignancies, with rates as high as 30% in males and 18% in women. Microflora found in BHT may be largely coincidental rather than causative, even though it has previously been linked to various microbial agents, including Aspergillus and Candida in the oral cavity [9].

Figure 1 Pseudo-black hairy tongue with bismuth salicylate use

CLINICAL DIAGNOSIS:

The primary diagnostic method for BHT is the visual intraoral examination. The dorsal tongue, which is anterior to the sulcus terminalis and circumvallate papillae, is preferred by BHT. A microscopic exam showing longer-than-3 mm filiform papillae on the dorsal tongue may be a diagnostic aid. Cultures could be used to rule out bacterial or fungal infections that are overlaid and linked to BHT [10]. In cases where the lesion exhibits characteristics of BHT and responds to mechanical debridement, a tongue biopsy is helpful but typically unnecessary. Another crucial step in diagnosing BHT is thoroughly examining recent drug changes and recognizing triggering events.

MANAGEMENT:

Black hairy tongue is harmless despite being alarming to the patient. Most of the time, medication is not needed for treatment. A topical antifungal might be utilised if fungal overgrowth is detected when the illness is symptomatic. The lesions can typically be resolved with empirical methods such as tongue scraping or brushing, better dental hygiene, and removing possible triggers, including smoke, candies, powerful mouthwashes, and antibiotics. In our opinion, the most effective preventive and therapeutic approaches involve teaching the patient about good oral hygiene (which includes quitting smoking) and promoting regular tongue brushing[11].

CASE PRESENTATION:

A female patient of age 62 years who had been diagnosed with Type II Diabetes Mellitus earlier was admitted to the hospital with a condition of Perirenal Abscess. She is habituated to chew tobacco leaves. She is on Rx with T. Metformin 500mg (B.D) and T. Glimepiride 2mg (O.D).The patient is currently being treated with a combination of Ampicillin 1gm– Sulbactam 0.5gm (1.5gm) through the Intravenous route. In the past, she had experienced anaphylactic reactions to Cephalosporin therapy. After a 30-day duration of starting her treatment, she found that her tongue was changing gradually to a black color. So, then she approached her clinician.

TREATMENT:

Rena abscesses can be treated with "Percutaneous

drainage" of pus cells from the tissues in the kidney.

A wide variety of antibiotics, such as Beta-lactam antibiotics, Penicillin, Cephalosporins, Aminoglycoside antibiotics, and Fluoroquinolones, are prescribed through the parenteral route to treat the Renal abscess.

Percutaneous Drainage:

The drainage of pus cells from the tissues can be done by placing a catheter with the help of a needle into the skin above the kidney.

Percutaneous drainage of renal abscesses is done under the guidance of Computerized Tomography (CT) and Ultrasonography.

In the most severe situation, surgery is preferred to minimize the risk of renal abscess[12].

Parenteral Antibiotics:

As percutaneous drainage has been the conventional method, Parenteral antibiotics have been used for the past ten years.

Good, effective treatment is provided for the patients by administering antibiotics through the intravenous route.

A perirenal abscess, also known as renal or kidney abscess, is a pocket of pus that develops in the kidney tissue due to the invasion of microorganisms. Kidney abscess results from the migration of bacteria to kidneys from another infection site on the body [13].

DISCUSSION:

One month after introducing the combination of Ampicillin and sulbactam, the patient had experienced blackish discoloration on her tongue.

Later on, she was diagnosed with an antibiotic-induced black hairy tongue. Various classes of antibiotics that cause Black hairy tongue include:

Beta lactam antibiotics: Penicillin G, Ampicillin, Amoxicillin, Cloxacillin.

Beta-lactamase inhibitors: Clavulanic acid, Thienamycin.

Cephalosporins: Cephalexin, Cefadroxil, Cefuroxime, Cefixime.

Aminoglycosides: Streptomycin,

Neomycin, Amikacin, Gentamicin.

Tetracyclines: Doxycycline, Chlortetracycline, Minocycline.

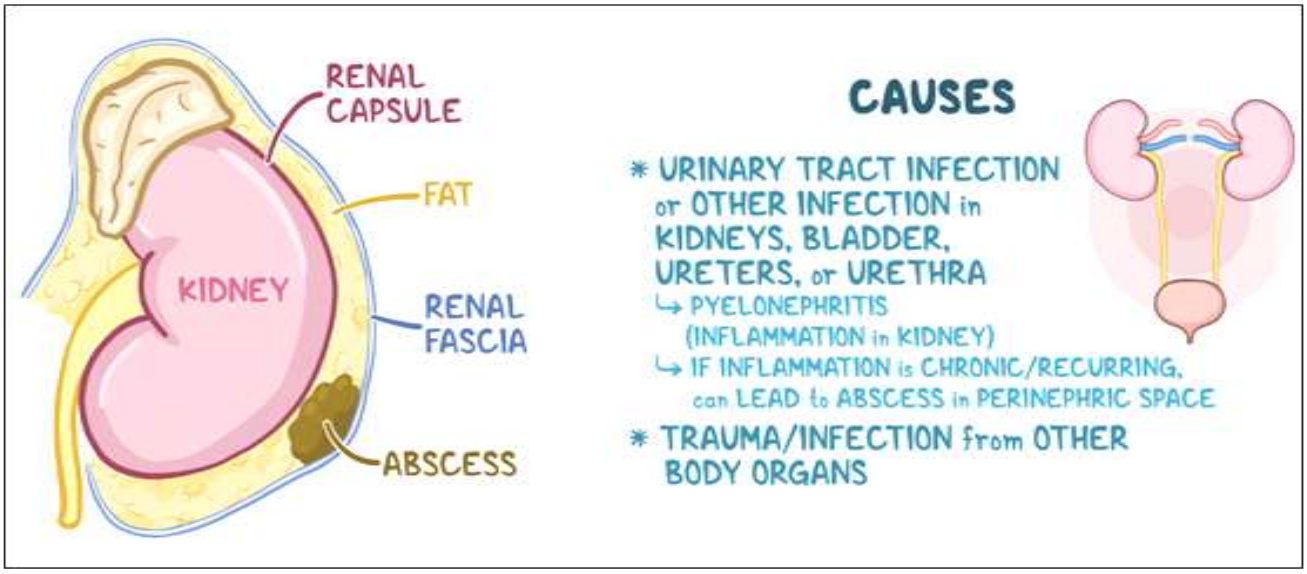

Figure 2 Causes of Black Hairy Tongue

EXPLANATION:

In other words, a Renal abscess is a collection of pus in the renal parenchyma.

Macrolides: Erythromycin, Azithromycin.

Miscellaneous substances include Linezolid, Metronidazole, and a combination of Piperacillin-Tazobactam

ETIOLOGICAL FACTORS:

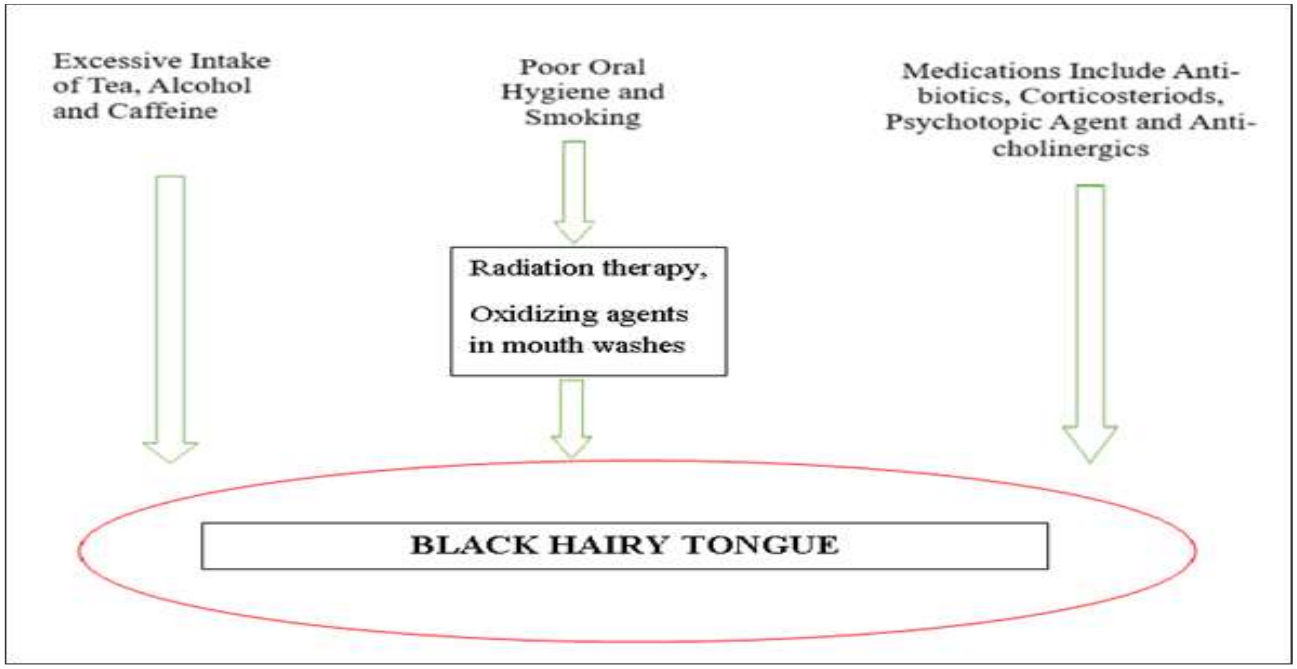

Figure 3 Flowchart of Etiological Factors of Black Hairy Tongue

PREVENTIVE MEASURES:

Figure 4 Preventive Measures

BLACK HAIRY TONGUE:

Synonym: Lingua villosa nigra.

A dark, furry tongue appearance is temporary, harmless, and rare.Lingua villosa nigra is a conspicuous, benign medical condition that is distinguished by protracted filiform lingual papillae and imperfect shedding of the squamous layer with a typical carpet-like appearance on the dorsal surface of the tongue [14].

UTILIZE PEROXIDE MOUTHWASH:

Figure 5 Therapeutical Result of the Treatment

PRECAUTIONS TO BE TAKEN BY PATIENT

Maintenance of good oral hygiene:

Keep the mouth clean and disease-free.

Brush your teeth twice a day.

Gargle the mouth with mouthwash, which is accessible from oxidizing agents.

Scrape the tongue daily with a tongue scraper.

Limit sugar-sweetened beverages, sugary, salty foods, and snacks.

Avoid sticky and acidic foods.

Reduce the excessive consumption of tea, caffeine, and alcohol.

Do not consume medications more frequently.

Tobacco chewing must be halted [15].

CONCLUSION:

In this article, we have seen a patient with a black hairy tongue undergoing treatment for a renal abscess with a combined drug: Ampicillin 1gm–Sulbactam0.5gm (1.5gm).

Later, a tiny hair follicle on the tongue with black color discoloration develops. Subsequently, treatment continued, and the physician recommended the patient maintain good oral hygiene & monitor the buccal cavity.

Some of the precautions suggested by the clinician are mentioned above. She avoids intake of tobacco leaves daily; after brushing, she cleanses the buccal cavity and monitors herself. As such, this is the daily activity she follows. Good progress in her buccal cavity is noticed in eradicating black discoloration of the tongue.

ACKNOWLEDGEMENT:

The Authors are thankful to the principal and the management of Swathi College of Pharmacy for their constant support in completing this review.

Funding Support: The Author declares that there is no funding.

Conflict of Interest: The Author declares that there is no conflict of interest.

REFERENCES

[1] Fatima Tous-Romero, Sara Burillo-Martínez, Marta Prieto-Barrios, and Lidia Maronas-Jiménez. Black hairy tongue cured concurrently with respiratory infection. *Cleveland Clinic Journal of Medicine*, 84(6):434–435, 2017.

[2] Jing Ren, Yao Zheng, Hui Du, Shan Wang, Linna Liu, Wanshi Duan, Zeping Zhang, Lijun

Heng, and Qi Yang. Antibiotic-induced black hairy tongue: two case reports and a literature review. *The Journal of International Medical Research*, 48(10):300060520961279, 2020.

[3] Hisatoshi Okumura, and Atsushi Kawashima. Black hairy tongue due to antibiotics: *BMJ Case Reports*, 16(7):e255112, 2023.

[4] Lut Tamam, and Bilge Burcak Annagur. Black hairy tongue associated with olanzapine treatment: a case report. *The Mount Sinai Journal of Medicine,* 73(6):891–894, 2006.

[5] P D Pigatto, F Spadari, L Meroni, and G Guzzi. Black hairy tongue associated with long-term oral erythromycin use. *Journal of the European Academy of Dermatology and Venereology*, 22(10):1269–1270, 2008.

[6] M Manabe, H W Lim, M Winzer, and C A Loomis. Architectural organization of filiform papillae in normal and black hairy tongue epithelium: dissection of differentiation pathways in a complex human epithelium according to their patterns of keratin expression. *Archives of Dermatology*, 135(2):177–181, 1999.

[7] G M Sarti , R I Haddy, D Schaffer, and J Kihm. Black hairy tongue. *American Family Physician*, 41(6):1751–1755, 1990.

[8] Y Harada, and H Gaafar. Black hairy tongue. A scanning electron microscopic study. *The Journal Laryngology and Otology,* 91(1):91-96, 1977.

[9] B N Akay, H Sanli, P Topcuoglu, G Zincircioğlu, C Gurgan, and A O Heper. Black hairy tongue after allogeneic stem cell transplantation: an unrecognized cutaneous presentation of graft-versus-host disease. *Transplantation Proceedings*, 42(10):4603-4607, 2010.

[10] I Weinstein, and M Rosencrans. Treatment of black hairy tongue with triamcinolone acetonide. Report of a case. *Oral Surgery, Oral Medicine, and Oral Pathology*, 15:1071-1074, 1962.

[11] J Jarvinen, A Kullaa-Mikkonen, and R Kotilainen. Some local and systemic factors related to tongue inflammation. *Proceedings of the Finnish Dental Society,* 85(3):199-209, 1989.

[12] J A Langtry, M M Carr, M C Steele, and F A Ive. Topical tretinoin: a new treatment for the black hairy tongue (lingua villosa nigra). *Clinical and Experimental Dermatology,* 17(3):163-164, 1992.

[13] N Levine. Dark discoloration of the tongue. *Geriatrics,* 51(6):20, 1996.

[14] M Manabe, H W Lim, M Winzer, and C A Loomis. Architectural organization of filiform papillae in normal and black hairy tongue epithelium: dissection of differentiation pathways in a complex human epithelium according to their patterns of keratin expression. *Archives Dermatology,* 135(2):177-181, 1999.

[15] J M Mc Gregor, and R J Hay. Oral retinoids to treat black hairy tongue. *Clinical and Experimental Dermatology,* 18(3):291, 1993.