

## Case Report

# Isoniazid-induced Alopecia: A Rare Entity

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## Abstract

A 32-year-old male patient diagnosed with smear positive pulmonary tuberculosis presented with excessive hair fall two months after starting anti-tuberculosis treatment. In the absence of any specific metabolic or dermatological cause, drug-induced alopecia was suspected. A review of the literature revealed isoniazid as the culprit drug. Isoniazid was withdrawn and the patient started having new hair growth gradually. [Indian J Chest Dis Allied Sci 2020;62:69-70]

**Key words:** Alopecia, Isoniazid, Dermatology

## Introduction

As per the global tuberculosis (TB) report 2018; the estimated incidence TB in India was approximately 2,800,000 cases accounting for about one-fourth of global TB burden.<sup>1</sup>

Isonicotinic acid hydrazide (INH) or simply isoniazid is a drug used in the treatment and prevention of TB. It is one of the most important drugs in the therapy of TB and was introduced into the treatment regimen in 1952. It is usually administered orally, but can be given as injection. Isoniazid is commonly used in combination with other drugs, such as rifampicin, ethambutol, pyrazinamide and streptomycin. These drugs are used with isoniazid in order to prevent, or delay, the development of isoniazid-resistant strains of *Mycobacterium tuberculosis*. The side effects of INH include hepatitis (especially in older patients), peripheral neuropathy (dose related incidence; 10%-20% incidence with 10mg/kg/day), loss of appetite, vomiting, abdominal pain, dizziness or weakness, and headache.<sup>2</sup> To the best of our knowledge, there are limited reports describing temporal association of isoniazid with alopecia. We report one such rare case presenting with hair loss after initiation of anti-tubercular treatment due to isoniazid.

## Case Report

A 32-year-old male patient was diagnosed with pulmonary TB after his sputum smear examination showed acid-fast bacilli on Ziehl-Neelsen stain and cartridge based nucleic acid amplification test (CBNAAT) detected *Mycobacterium tuberculosis*. Rifampicin resistance was not detected in CBNAAT. He



**Figure.** Hair loss observed on bilateral eyebrows, facial hair, scalp and over legs.

was put on fixed dose combination (FDC) tablets as per weight band under directly observed treatment, short-course (DOTS) containing isoniazid (300mg), rifampicin (450mg), ethambutol (1200mg), pyrazinamide (1500mg) along with pyridoxine. After two months from the initiation of the treatment, he developed excessive hair fall (Figure). There was no significant past medical or any drug history.

The patient was investigated thoroughly for any metabolic abnormality. Serum cortisol: 14.49mcg/dL, fasting blood sugar: 68mg/dL, post-prandial blood sugar 94mg/dL, glycated haemoglobin (HbA1C): 5.4%, free triiodothyronine: 2.0pg/mL, free thyroxine: 1.1ng/mL, thyroid stimulating hormone: 3.3mIU/L were all within normal limits. Connective tissue disorder (CTD) profile was also within normal limits (negative antinuclear antibody; anti-double stranded DNA 8.46U/L, angiotensin-converting enzyme 15.7 microliter, proteinase-3 antineutrophil cytoplasmic antibody: 3.21, myeloperoxidase antineutrophil cytoplasmic antibody 2.18 were also normal. The patient was also non-reactive for hepatitis-B surface antigen, hepatitis-C antibody,

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human immunodeficiency virus and venereal disease research laboratory (VDRL) tests. All other routine blood parameters were within normal limits.

Isoniazid was suspected as the probable cause of alopecia and was stopped while other drugs were continued along with vitamin supplements. Dermatologist's consultation was taken and respective treatment with topical minoxidil, steroid ointment, keratin supplements and other supportive care was started. There was total hair regain after stopping isoniazid.

## Discussion

Alopecia is the most common clinical manifestation in patients on antimetabolic drugs, which may be presented as cicatricial (scarring) and non-cicatricial (non-scarring).<sup>13</sup> In the scarring type, a group of connective tissue disorders (lupus erythematosus, lichen planus, scleroderma, dermatomyositis, sarcoidosis, malignancy, etc.) destroys the hair follicles to replace it with scar tissue and causes permanent hair loss. In non-cicatricial alopecia, the underlying cause is usually the drugs apart from androgenic alopecia. It is a type of alopecia that is reversible upon discontinuation of the offending agent. Examples of such drugs include anti-coagulants, anti-hyperlipidemic drugs, tricyclic anti-depressants, anti-thyroid drugs, oral contraceptives, cimetidine and few anti-tuberculosis drugs (isoniazid, thiacetazone and ethionamide). In a study of 163 patients on chemotherapeutic agents; 5.5% (9 patients) developed alopecia.<sup>4</sup>

Anti-tuberculosis drugs usually cause non-cicatricial alopecia. Anti-tubercular drugs isoniazid, thiacetazone, and ethionamide have been found to be associated with alopecia. FitzGerald *et al*<sup>5</sup> reported five cases with alopecia associated with antituberculosis therapy during treatment of 141 cases of tuberculosis. Three of the five cases were HIV-positive. After about two-three months of therapy, patients complained of alopecia. Isoniazid was thought to be the cause of alopecia and hair growth resumed when drug was removed from the regimen.

Sharma *et al*<sup>6</sup> reported a similar case of a 32-year-old woman who developed generalised lichenoid eruptions on her body followed by diffuse loss of scalp hair of the anagen effluvium type when receiving several

anti-tubercular drugs, including isoniazid, rifampicin, pyrazinamide, and ethambutol for abdominal TB. Isoniazid was withdrawn; with continuation of other antitubercular drugs and there was complete recovery of hair loss.<sup>6</sup> Gupta *et al*<sup>7</sup> reported another case of isoniazid-induced alopecia in a 30-year-old female. Hair regrowth was observed after two months of stopping the isoniazid.

Alopecia is also associated with ethionamide in few studies.<sup>8,9</sup> Arshad *et al*<sup>8</sup> reported a case of alopecia associated with ethionamide in 1984. Gupta *et al*<sup>9</sup> reported diffuse toxic alopecia from thiacetazone therapy. In the present patient, other conditions causing alopecia were excluded by clinical examination and laboratory investigations for CTD profile, thyroid profile, cortisol and viral serology. Growth of hair on bald areas after the withdrawal of isoniazid and continuation of other antitubercular drugs confirmed that alopecia was due to isoniazid. Every treating physician should be aware of this side effect and a high index of suspicion should be there if a patient complains of hair loss.

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