Case Report

White piedra of scalp hair by *Trichosporon inkin*

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ABSTRACT

White piedra is a rare fungal infection of hair and is reported to be all the more rare on scalp. *Trichosporon inkin* is usually associated with white piedra of pubic hair. We report a case of white piedra of scalp hair caused by *T. inkin*. This is the first case reported from India and the fifth case reported worldwide. A 50-year-old Muslim female presented with white knots over scalp hair. Diagnosis of *Trichosporon* was made by examining KOH mounts of epilated hair and Lactophenol Cotton Blue preparations of the growth in culture. Automated mini-API test (for biochemical profiles) and Electronmicroscopy studies (for cell wall structures) helped in identification of the species. Mini-API test was also positive for *Cryptococcus curvatus* which could be due to similarity in biochemical and physiological properties of the two species. Absence of *C. curvatus* on culture further supports this view. Topical antifungal therapy resulted in clinical clearance within 2 months. Higher incidence of scalp white piedra is observed in Muslim females; contributing factor being the custom of using a veil, leading to higher humidity and limited sunlight exposure.

Key words: *Trichosporon inkin*, white piedra, Scalp

INTRODUCTION

Piedra is a type of superficial mycoses and occurs in two types- black and white piedra. Clinical features in both varieties can range from asymptomatic infection to progressive weakness of hair shafts leading to hairfall. Infection of scalp hair by white piedra is rare and *Trichosporon ovoides* is believed to be the major cause.[1] A case of scalp white piedra caused by *Trichosporon inkin* is reported here which is the first case reported from India and fifth case reported worldwide.

CASE REPORT

A 50-year-old Muslim female patient presented to dermatology clinic complaining of white knots of scalp hair of 15-days duration. She also complained of hair fall. On enquiry, there was history of tying of hair immediately after washing and use of a veil to cover hair. Other significant details were use of hair oil of plant origin, henna as a hair-coloring agent and occasional use of bathing bar for scalp cleansing. She had no systemic complaints or history suggestive of any immunodeficiency. There was no history of similar complaints in family. On examination of scalp hair brownish yellow, superficial nodules, adherent to hair shaft were found [Figure 1]. There was no evidence of nits or lice. Hair pull test was negative. Wood's lamp examination did not show fluorescence. Axillary or pubic regions were not involved and systemic examination was normal. Routine investigations were normal and ELISA for HIV was negative. Clinically, differential diagnoses of white piedra, peripilar keratin cast and trichorrhexis nodosa were considered.

Hair clipping was done for detailed mycological examination and species identification. KOH digested wet mount showed clusters of blastoconidia and assemblage of true and psuedohyphae. When cultured

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on Sabouraud's agar fortified with cycloheximide at 30°C aerobically for one week, cream colored wrinkled colonies, heaped at the center were seen. These were characteristic of *Trichosporon* species [Figure 2]. Lactophenol Cotton blue mount showed pleomorphic yeast cells and septate hyphae [Figure 3]. For subspecies identification, carbohydrate assimilation tests with API 20C Aux were performed. These revealed the causative organism to be *T. inkin* (Lactose utilization 100%; Indol utilization 75%). This test was also positive for *Cryptococcus curvatus*; however, *C. curvatus* could not be isolated from the culture. For further confirmation of organism by electron microscopy a culture on cornmeal agar was performed which after 72 hours of incubation at 25°C produced true hyphae. Culture suspension of hyphal form was centrifuged and subjected to electron microscopy for species identification. Electron microscopy showed dolipore like structure with inflated margins and confirmed the species as *T. inkin*.

Patient responded to topical clotrimazole lotion twice daily on the scalp along with ketoconazole shampoo thrice a week for 2 months. Oral biotin 5 mg once daily was supplemented for complaints of diffuse hair loss. She was also instructed to avoid oil application and tying of wet hair.

DISCUSSION

White piedra affects pubic hair, axillary hair, moustaches, beard and eyebrows; whereas black piedra affects scalp hair.[1]

Highest frequency of scalp white piedra is observed in young females; with tying of wet hair, application of plant hair oil and warm humid climate being the predisposing factors.[2] Higher incidence of piedra reported in Muslim females could be related to the custom of using veil which limits exposure to sunlight and increases humidity. From India, two cases reported by Tambe *et al.*,[3] and 12 cases by Khandpur *et al.*,[2] were also Muslim females as in this case. Limited exposure to sunlight predisposes to yeast infections; but its effect specifically on piedra needs to be studied further. Family history was negative in this case, but is important as there can be sharing of the same comb and towel in a family.

White piedra is caused by six species of genus *Trichosporon* i.e., *T. asahii, T. ovoides, T. inkin, T. Mucoides, T. asteroides* and *T. cutaneum*.[1] Recently

Figure 1: Clinical photograph showing brownish white gritty nodules adherent to the scalp hair

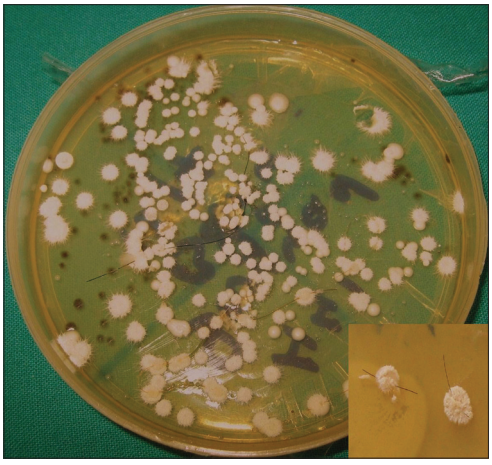

Figure 2: Classical cerebriform, yeast-like colonies of the isolated organism

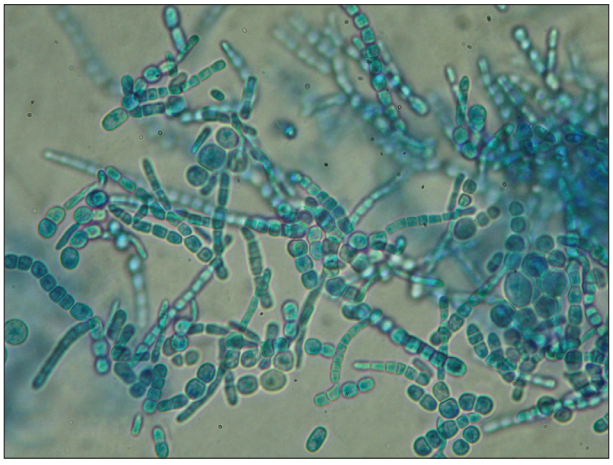

Figure 3: Lactophenol Cotton blue mount of the isolated pathogen, showing yeast cells and septate hyphae (×400)

a new species-*Trichosporon dohaense* has been isolated.[4] *T. inkin* is the most common causative agent of white piedra of pubic hair but here it was found to involve scalp hair. Till date, only four cases have been reported worldwide with *T. inkin* as causative agent of white piedra of scalp hair [Table 1]. In all the cases reported, patients were females as seen in this case.

Methods employed for mycological confirmation of diagnosis include digesting of hair shaft nodule with 10-15% KOH to visualize hyphae. In white piedra, darkly stained and loosely arranged hyphae, blastoconidia and arthroconidia are seen. On Sabouraud dextrose agar, cerebriform colonies are formed which lack a marginal zone and often crack the agar at periphery. Lactophenol cotton blue mount reveals hyphae and arthroconidia characteristic of *Trichosporon* species.[1] Species identification can be done by morphological methods, biochemical methods and molecular methods. Biochemical identification can be done by RapID Yeast Plus system, API 20C Aux system and Vitek Yeast Biochemical Card.[7] Electron microscopy also helps in species identification by recognising various details like cross-section of the cell wall and septum.[8] Several methods have been proposed for molecular identification of species like ribosomal DNA internal transcribed spacer region (ITS), 26S D1/D2 rDNA analysis and ribosomal DNA intergenic spacer (IGS) analysis.[9] In present case mini-API test revealed *C. curvatus* along with *T. inkin*. However, on culture *Cryptococcus* was not found but hyphal forms and colonies characteristic of *Trichosporon* were detected. This could be due to similarity in utilization of various carbohydrates by *Trichosporon* and *Cryptococcus*.[10]

Table 1: Details of cases of scalp white piedra by *T. inkin*

Year	Country	Comments
2004	Qatar	First case of scalp white piedra by *T. inkin* with coisolation of *Candida parapsilosis*.[5]
2008	Brazil	Two cases of scalp white piedra by *T. inkin* reported in a study which included first case below 10 yrs of age, in a 4-yr-old child.[6]
2009	Qatar	One case of scalp white piedra by *T. inkin* isolated. A new species *Trichosporon dohaense* was identified.[4]

Topical and systemic antifungals can be used in treatment of scalp white piedra. Taj-Aldeen *et al*.,[5] used ketoconazole shampoo for daily application followed by econazole shampoo and cream for 2 months for successfully treating white piedra of scalp due to *T. inkin*. Our patient also responded well to topical treatment.

This case has been reported to highlight an unusual organism *T. inkin* as the causative agent of scalp white piedra in a Muslim female.

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