

# Adult tinea capitis and tinea barbae in a tertiary Portuguese hospital: A 11-year audit

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## Summary

Adult tinea capitis and tinea barbae are nowadays considered uncommon in developed countries. Despite their potential for morbidity and healthcare costs, few series have attempted to characterise these infectious disorders. We conducted a cross-sectional study to analyse the epidemiological, clinical and mycological characteristics of adult tinea capitis and tinea barbae of a large tertiary centre in Southern Europe. All adult patients with a mycological-confirmed tinea capitis or barbae over a 11-year period (January 2008 to December 2018) were considered for the analysis. Concerning tinea capitis, 860 culture-confirmed diagnoses were made during this 11-year period, of which only 15 (1.5%) occurred in adults (15 patients). A disproportionately high number of patients were female and immunocompromised. *Microsporum audouinii* (20%) and *Trichophyton rubrum* (20%) were the most common isolates. Half of the cases were initially misdiagnosed. Regarding tinea barbae, 7 cases were diagnosed over this time period. Overuse of topical steroids was widespread in this population. *Trichophyton rubrum* was the infectious agent in all cases. Initial misdiagnosis was very common (43%). Adult tinea capitis and tinea barbae can still be observed in contemporary practice and remain a public health concern, with the immunosuppressed patient being particularly affected. Initial misdiagnosis is a common occurrence. Anthropophilic fungi are now the most common aetiologic agents of these infections, and they will probably continue to do so as the large urban centres expand peripherally. Awareness for this diagnosis is necessary to prevent unwarranted morbidity and costs.

## KEYWORDS

dermatomycoses, epidemiology, tinea barbae, tinea capitis

## 1 | INTRODUCTION

Dermatomycoses are common infections caused by fungi that invade and multiply in the keratinised tissues, such as skin, nails and hair. The latter adnexa can be affected by two distinct dermatomycoses: tinea capitis (TC), an infectious disease of the scalp hair and intervening skin which is almost only seen in pre-pubertal children, and tinea barbae or also called tinea sycosis,<sup>1</sup>

which is a fungal infection of the beard and moustache. Albeit rare, both disorders can imply major morbidity and healthcare costs. In spite of their importance, few series have evaluated their characteristics.

The aim of the present study was to analyse the epidemiological, clinical and mycological characteristics of both adult tinea capitis and tinea barbae diagnosed over a period of 11 years in a large tertiary hospital centre in Lisbon, Portugal.

**TABLE 1** Clinical and mycological tinea capitis and tinea barbae patient's data

Patient number	Gender	Age at diagnosis	Years of diagnosis	Ethnicity	Immunosuppression	Other significant comorbidities
Adult tinea capitis						
I	M	86	2010	Caucasian	None	None
II	F	41	2010	African	HIV-2, low CD4	CKD-HD
III	F	59	2013	African	MTX 20 mg/wk + PDN 10 mg/day	Rheumatoid Arthritis
IV	F	71	2013	Caucasian	Untreated type II DM	Depression
V	F	35	2014	African	None	None
VI	F	18	2014	Caucasian	None	None
VII	F	22	2015	Caucasian	None	None
VIII	F	24	2015	Caucasian	None	None
IX	F	86	2015	Caucasian	HIV-1, normal CD4	Seborrhoeic dermatitis
X	F	39	2015	Caucasian	HIV-1, low CD4	Facial paralysis
XI	M	19	2016	Caucasian	None	None
XII	M	59	2017	African	Systemic lymphoma	None
XIII	M	23	2018	Caucasian	SLE	SAAF
XIV	M	20	2018	Caucasian	None	None
XV	M	48	2018	Caucasian	None	None
Tinea barbae						
I	M	53	2013	Caucasian	None	CLD, CKD
II	M	60	2013	Caucasian	CsA 200 mg/d + PDN 10 mg/d	Psoriasis, BP
III	M	68	2015	Caucasian	None	None
IV	F	68	2015	Caucasian	None	Hirsutism
V	M	42	2017	Caucasian	TS overuse	None
VI	M	44	2017	Caucasian	None	None
VII	M	60	2018	African	TS overuse	None

Abbreviations: BP, bullous pemphigoid; CKD, chronic kidney disease; CLD, chronic liver disease; CR, complete response to therapy; CsA, oral cyclosporine A; ITR, itraconazole 200 mg/day; M, "x", microsporum species; MS, misdiagnosis at first dermatological observation; PDN, oral prednisolone; SLE, systemic lupus erythematosus; T. "x", trichophyton species; TBF, terbinafine 250 mg/day; TS, high potency topical steroids.

## 2 | METHODS

### 2.1 | Data gathering and analysis

A cross-sectional study was performed at a major tertiary Dermatology Department in Southern Europe (Centro Hospitalar Universitário de Lisboa Central). All electronic medical and mycological records of culture-proven tinea capitis and/or barbae over an 11-year period (from January 2008 to December 2018) were captured through database searching tools hosted at the institution. Data were then extracted and reviewed. Patients were considered eligible if they were aged 18 years or older and had mycological-confirmed tinea capitis and/or barbae, defined by the presence of fungal growth in culture at the 4th and/or the 6th weeks. Retrieved data are summarised in Table 1.

### 2.2 | Mycologic investigation

Sterilised epilation forceps were used to collect hairs and scales for examination. All samples were retrieved, conditioned and prepared by the same qualified Laboratory Technician and subjected to both direct examination and culture. Direct examination was performed with the sample and 40% potassium hydroxide solution. Samples were also cultured on Mycobiotic agar (BBL) at 24°C for 3 weeks and subjected to weekly observations. Cultures devoid of growth at the 10th day were recultured in the same conditions, followed by weekly observations. If the primary culture was suggestive of bacterial contamination, the routine culture medium was enriched with 0.5 g of Chloramphenicol. Whenever needed, subcultures tailored to the specimen's specific needs for growth were also performed.

Concomitant superficial tinea							
Faciei	Corporis	Pedis	Unguium	MS	Direct examination	Culture	Treatment
				No	+	<i>T rubrum</i>	TBF- 4 wk
	x			No	+	<i>T soudanense</i>	TBF- 4 wk
x		x		Yes	-	<i>T rubrum</i>	TBF- 4 wk
		x	x	No	-	<i>T tonsurans</i>	TBF- 12 wk
				No	+	<i>M audouinii</i>	ITR- 6 wk
x				No	+	<i>M ferrugineum</i>	TBF- 8 wk
				No	+	<i>M audouinii</i>	TBF- 8 wk
				No	+	<i>M audouinii</i>	ITR - 6 wk
x				No	+	<i>T violaceum</i>	TBF- 12 wk
	x			No	+	<i>M canis</i>	TBF- 8 wk
				Yes	+	<i>T soudanense</i>	ITR - 6 wk
				No	+	<i>T rubrum</i>	TBF- 4 wk
				Yes	+	<i>T mentagrophytes</i>	TBF- 4 wk
	x			Yes	+	<i>T tonsurans</i>	ITR - 6 wk
				No	-	<i>T mentagrophytes</i>	TBF- 4 wk
	x	x		No	+	<i>T rubrum</i>	TBF- 4 wk
	x			No	+	<i>T rubrum</i>	TBF- 4 wk
				Yes	+	<i>T rubrum</i>	TBF- 4 wk
				Yes	-	<i>T rubrum</i>	TBF- 4 wk
		x		No	-	<i>T rubrum</i>	ITR - 4 wk
		x	x	No	+	<i>T rubrum</i>	TBF- 4 wk
x				Yes	+	<i>T rubrum</i>	TBF- 4 wk

### 3 | RESULTS

A total of 10 912 mycological analyses were performed by the Mycological Unit from 2008 to 2018.

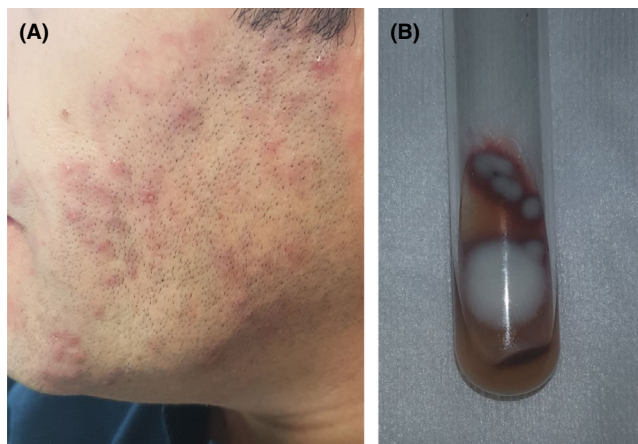
#### 3.1 | Tinea capitis

A total of 860 culture-confirmed diagnoses of tinea capitis were made during this 11-year period, of which only 15 (1.5%) occurred in adults. Most patients were female (60%) and Caucasian; albeit individuals of African origin were significantly and disproportionately present in the series (27%). Mean age at the time of diagnosis was 43.3 years (18-86). Almost half (46%) of the patients had relevant immunosuppression, mostly related to a human immunodeficiency virus (HIV) infection.

Concerning mycologic isolates, *Microsporum audouinii* (20%) and *Trichophyton rubrum* (20%) were the most common aetiologic agents. Nearly half of the patients had a synchronic fungal infection, being tinea faciei (20%) and tinea corporis (20%) the most common. Four cases (27%) were misdiagnosed the first time they were observed by a dermatologist. Clinical cure was achieved in all patients with systemic antifungals. Oral terbinafine 250mg/day for four weeks was the most used antimycotic agent (47%) followed by itraconazole 200 mg/day for 6 weeks (27%).

#### 3.2 | Tinea barbae

A total of seven diagnoses of tinea barbae (Figure 1) were made during this 11-year period (all in adults). Most cases were observed in Caucasian men, except one that was diagnosed in a woman with



**FIGURE 1** A, Tinea barbae in a 48-y-old, otherwise healthy man. B, Culture confirming *Trichophyton rubrum* infection

idiopathic hirsutism. Mean age at the time of diagnosis was 56.3 years (42–68). Four patients had a compromised local or systemic immune status, of which two were related to the overuse of potent topical steroids in the beard area. None were infected with HIV.

Concerning mycologic isolates, *T rubrum* caused all of the diagnosed infections. Most patients (5/7) had a concurrent fungal infection, of which tinea pedis (60%) and cruris (60%) were the most frequent. Three cases (43%) were misdiagnosed the first time they were observed by a dermatologist. Clinical cure was achieved in all patients with systemic antifungals. Oral terbinafine 250 mg/day for 4 weeks was the therapeutic option prescribed in almost all cases.

## 4 | DISCUSSION

Tinea barbae is an old disease and has received little attention in the literature in the past decade. One of the largest focused studies is from Lacerda MH et al,<sup>2</sup> published in 1981. Remarkable improvements in lifestyle and hygiene habits have happened since then, and as demonstrated by this 11-year survey, tinea barbae is nowadays an uncommon infection. For instance, tinea barbae was more commonly observed when single-use razors were not yet available.<sup>3,4</sup> Albeit geographic differences have to be considered, and a 46.1% reduction in the number of diagnosed cases was observed in this study compared with a similar review realised in the past decade at another tertiary Portuguese hospital.<sup>5</sup> It is clear that facial overuse of high-strength topical steroids is a major issue perpetuating this disorder, which stands demonstrated both in our study and in others.<sup>6</sup> Misdiagnosis is also very common (43%), as the condition is known to resemble folliculitis or pseudofolliculitis barbae.<sup>7</sup> From a mycological perspective, it is remarkable that *T rubrum* was the aetiologic agent in all cases of tinea barbae. Our data confirm and reinforce the recent 3-year survey by Rato et al<sup>8</sup> and Marques Pereira et al,<sup>9</sup> which, in contrast to the northern regions of Portugal where tinea barbae is mostly caused by zoophilic species (*Microsporum canis*, *Trichophyton mentagrophytes var granulare*, leveduriform fungi),

in Lisbon, a major urban centre, the anthropophilic species such as *T rubrum* predominate. For instance, this geographic distinction is similar to the one found in adult tinea capitis.

Limitations of this study included the retrospective design, small sample size, potential missing data and subnotification of cases, as it is somewhat common practice by physicians to initiate empiric therapy without conducting a mycological investigation, when the clinical suspicion is very high. Being a single-centre study in a major urban area might jeopardise the external validity when attempting to reproduce this study in a non-urban environment.

## 5 | CONCLUSIONS

Albeit uncommon, tinea capitis and tinea barbae can still be observed in contemporary practice and remain a public health concern. A continuous shift towards causative anthropophilic fungi is expected in large and expanding urban centres. Heightened awareness for this diagnosis is necessary to prevent misdiagnosis, unwarranted morbidity and costs, particularly in the setting of an immunosuppressed patient.

## CONFLICTS OF INTEREST

Dr Duarte, Dr Galhardas and Dr Cabete have nothing to declare.

## AUTHOR CONTRIBUTIONS

B Duarte analysed the data and led the writing; C Galhardas and J Cabete conceived the study, designed the study and retrieved the data. All authors revised the manuscript critically.

## ETHICAL APPROVAL

The authors confirm that the ethical policies of the journal, as noted on the journal's author guidelines page, have been adhered to. No ethical approval was required as the research in this article related to micro-organisms.

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