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Belgian national survey on tinea capitis Epidemiology and molecular investigations

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Objectives

Tinea capitis (TC) is a superficial infection of the scalp caused by dermatophytes which affects mainly prepubescent children. This last decade, an increase of African anthropophilic strains causing tinea capitis, has been observed in Europe, probably due to immigration waves from African countries. The Belgian National Reference Center for Mycosis (NRC) has conducted a surveillance study about TC in 2018. This work presents final results of the study for the epidemiological part and preliminary results for the molecular part.

Methods



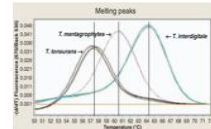
Samples collection of TC cases from January 2018 to December 2018 (14 laboratories from North and South Belgium)



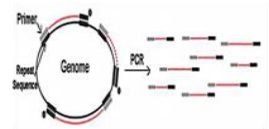
Epidemiological form associated to each case of TC to be filled by the dermatologist in charge of the patient



ITS sequencing for strains identification



DermaGenius (PathoNostics) on doubtful strains and for every *T. soudanense*/*T. violaceum* suspected strain



Genomic analysis by Rep-PCR (Diversilab, BioMerieux) on all *M. audouinii* confirmed strains

Results

1) Epidemiological analysis

>A total of 337 strains have been collected from 337 patients. The main population concerned by TC was children from 5-9 years (165/337, 49,01%, $p=0,01$). Males (214/337, 63,5%) were more affected than females (123/337, 36,5%), the sex ratio M/F was of 1,74. The majority of the strains was collected in Brussels area (181/337, 53,8%, $p<0,0001$), followed by Liege area (73/337; 21,7%). Other Belgian cities were less concerned by TC. Among known ethnical origins ($n=119$), African people (114/119, 96,2%) were more concerned by TC than European people (5/119, 3,8%, $p<0,0001$). The majority of patients were from Guinea (26/119, 21,8%), followed by Cameroun (14/119, 11,8%) and RDC (14/119, 11,8%), many other African nationalities were represented (12 different countries, all over Africa). The main transmission mode of TC was the familial way (83,3% among known cases $n=126$, 105/126, $p=0,03$).

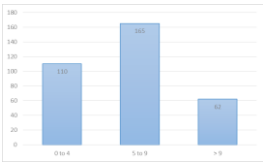


Figure 1: Repartition by the age of the patients $n=337$

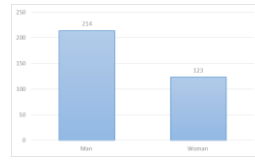


Figure 2: Repartition by the sex of the patients $n=337$

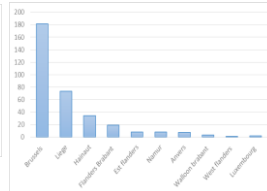


Figure 3: Repartition by geographical region of the patients $n=336$

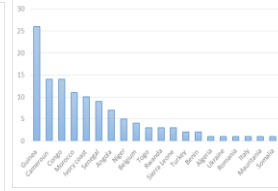


Figure 4: Repartition by ethnical origin of the patients $n=119$

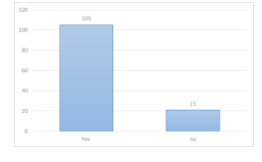


Figure 5: Repartition showing if infection in the family was observed or not ($n=126$)

>The major etiological agent was *Microsporum audouinii* (118/337, 35%) followed by *Trichophyton soudanense* (83/337, 24,6%), *T. tonsurans* (27/337, 17%), *M. canis* (36/337, 10,7%), *T. violaceum* (28/337, 8,3%), *T. benhamiae* (7/337, 2,1%), *T. mentagrophytes* (5/337, 1,48%) and *M. incurvatum* (1/337, 0,3%). This last rare dermatophyte species has never been reported as responsible for TC in Belgium before.

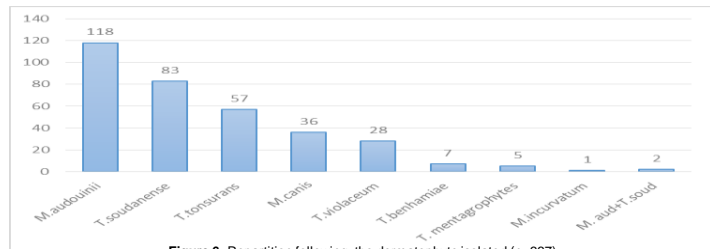


Figure 6: Repartition following the dermatophyte isolated ($n=337$)

2) Genomic analysis

> *M. audouinii* strains have been genotyped by rep-PCR and three genotypic variants have been characterized, one of them circulating mainly in Brussels area. No link with a particular ethnical origin could be found among the three defined genotypic groups

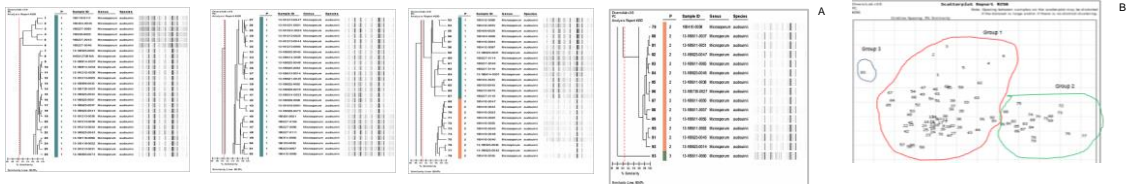


Figure 7 A: Dendrograms with DNA fingerprints showing the three different genomic groups defined by rep-PCR. B: Scatterplot showing the three different genomic groups defined by Rep-PCR

Conclusions

African anthropophilic dermatophytes such as *M.audouinii* and *T. soudanense* are mainly responsible for tinea capitis in Belgium. Large cosmopolitan cities like Brussels and Liege are the most concerned. People from African origin are mostly affected by TC. Among the *M. audouinii* strains circulating in Belgium, a genotypic diversity has been characterized