

In the last decades, several imported cases of African histoplasmosis have been reported; the majority of them appeared only 40 years after exposure and in soldiers that fought in Portuguese African countries during the sixties. Increase in travelling and migrations contribute to changes in the epidemiological pattern of this infection. Nevertheless, the true burden of African histoplasmosis is not fully known since it is not a notifiable disease. The aim of this work was to review the number of cases of African histoplasmosis reported in Portugal during an 8 year period and raise the attention to the clinical features of this infection and to the importance of including histoplasmosis in the differential diagnosis of infectious diseases.

Methods: We retrospectively reviewed cases of African histoplasmosis diagnosed in Portugal at the Mycology National Reference Laboratory and cases published in scientific papers from 2009 to 2017. Published cases were searched using the following search engines: PubMed, and B-on Platform. Collected data included clinical presentation, underlying disease, outcome, age and gender, country of exposure, place of birth, period of exposure and methodology for the diagnosis.

Results: Between 2009 and 2016, eight cases of African histoplasmosis were reported (Table 1), five were localized infections, whereas three patients presented disseminated infection with multiple lesions. In this last case, two of the patients were children. In all cases except one, patient were male, with a median age of 62 years old. Three patients born in Guinea-Bissau and five have born in Portugal and had been exposed in Guinea-Bissau or Angola long time ago. The median latency period after exposure was 40.5 years. Culture was positive in 7 out of 8 cases. Histological stains for fungi were performed in 7 cases and narrow large based yeasts were observed in all the cases. Antibody testing was performed in 3 cases but only 1 was positive.

Conclusion: Although Histoplasmosis is considered as a rare disease in Portugal, these data should be kept in mind for persons who born in or travelled to Africa, even many years after returning from the disease-endemic area. Underlying immunosuppression is not condition for this infection. Histological stains for fungi and culture are both gold standard for diagnosis. Molecular methods are not commercially available and antibody detection may not be as sensitive for African histoplasmosis as it is for the *capsulatum* variety. Increased

intercontinental travelling raises the risk of acquiring endemic infections like histoplasmosis. Prognosis of the disease depends on early diagnosis and administration of appropriate and well-conducted therapy. Surveillance is mandatory to understand the true burden of the disease.

P158 | Fungal contaminants—a paradoxical void in safety regulation of drinking water and recreational areas

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Objectives: The United Nations sustainable development goal #3, aims to “By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination” (New York, September 2015). This study’s objective is to assess the European drinking and bathing water regulations and detect missing fungal parameters that may affect human health.

Methods: Analytical review of European regulatory documents (Directives and member-states’ legislation), scientific reports (<https://doi.org/10.1128/jcm.41.9.4101-4106.2003>; <https://doi.org/10.1097/ede.0b013e31823b504c>).

Results and discussion: Exposure to fungi and their metabolites by inhalation, contact and ingestion has often been addressed, but rarely made way into safety regulation. Indoor air quality in Portugal is an exception, with fungi added to national legislation upon transposing the European directive 2008/50/CE. The EU drinking water directive 98/83/EC and the national legislation in the European countries—with very few exceptions—fails to address fungi explicitly.

Microbiological safety of drinking and recreational waters is monitored by bacterial parameters indicating faecal contamination. These parameters correlate with gastro-intestinal illness but leave behind microbes that cause illness other than gastro-intestinal, and also several emerging pathogens (Novak-Babic *et al.*, submitted). Bathing/recreational waters also use faecal indicator bacteria as parameters to regulate their safe use, but also leave behind fungi, both for coastal and inland/fresh waters. In Europe, the regulatory Directive 2006/7/EC is currently undergoing its second revision, since it was first created in 1976. There is no plan to introduce fungi during the ongoing revision. Yet, fungi in water often originate in sand and are washed-in by tidal retraction and rain (<https://doi.org/10.1017/s0025315415000843>).

Should the regulation on fungal exposure via drinking water not take place in times of emerging agents and resistance to antimicrobials? Of new composite materials for building and wearing? When saving energy and water on home and industrial appliances is the rule, reducing the water flow rate of distribution and temperatures of operating cycles?

TABLE 1 Summary of data on cases of African Histoplasmosis diagnosed in Portugal from 2009 to 2016

Patient	Year of diagnosis	Gender	Age when diagnosed (yrs)	Place of birth	Country of exposure	Latency period (yrs)	Clinical presentation	Presence of bone lesions	Underlying disease	Antifungal Treatment	Outcome
1	2009	male	38	Guinea-Bissau	Guinea-Bissau	11	intra abdominal abscess	no	none	liposomal Ampho-B/ itraconazole	full recovery
2	2013	male	76	Portugal	Guinea-Bissau/ Angola	41	skin ulcer	no	HIV/AIDS treated TB	liposomal Ampho-B/ itraconazole liposomal	recovery
3	2013	male	12	Guinea-Bissau	Guinea-Bissau	12	skin ulcer	no	TB	Ampho-B/ itraconazole /posaconazole	recovery
4	2014	male	60	Portugal	Guinea-Bissau	45	pulmonary nodule	no	none	itraconazole >7 years	symptoms recovery but persistence of nodules
5	2015	male	64	Portugal	Angola	40	Collon Ulcer	no	hepatic disease	liposomal Ampho-B/ itraconazole	parcial recovery
6	2015	male	68	Portugal	Angola	44	tonsillar ulcer foot lesion reactivation	no	none	itraconazole	recovery
7	2016	male	72	Portugal	PALOP	49	ancient histoplasmosis (at age 23 yrs old)	yes	chronic kidney disease	liposomal Ampho-B/ itraconazole	parcial recovery
8	2016	female	7	Guinea-Bissau	Guinea-Bissau	1	multiple cutaneous and subcutaneous ulcers	yes	none	liposomal Ampho-B/ Posaconazole	stabilized

When we go to the beach where do we spend most of the time? Is it in the water or on sand? Rodents roam freely at night, along with other kinds of wild and semi-domestic life, interacting with the sand that we possibly lie on and play with during the day. The abrasive nature of sand increases shedding into sand; so why is the regulation addressing only the water and not the sand itself? The World Health Organization recommended sand monitoring already in 2003 (Guidelines for safe recreational water environments—Volume 1: Coastal and fresh waters).

Sandboxes fall in this same category—not regulated for any microbial contaminants. The lack of salt from nearing seawater and of extreme sun exposure, allow fungal proliferation and resilience where children are intended to play. One quarter of the human population worldwide, and up to 50% of the elderly, is estimated to suffer from superficial fungal infections (<https://doi.org/10.1111/j.1365-2710.2009.01107.x>).

Conclusion: There is clear evidence that beach sand matters and that fungal contaminants in drinking water distribution systems cause direct harm to human health. Regulation needs updating to include fungal parameters.

P159 | FungiScope™—News on the global emerging fungal infection registry

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Background: Numbers of rare invasive fungal diseases (IFD) are rising worldwide due to increasing patient population at risk. To broaden the knowledge on epidemiology of rare IFD and eventually improving diagnosis and clinical outcome, FungiScope™, a global registry for rare IFD, has been initiated.

Methods: FungiScope uses web-based data capture (www.clinicalsurveys.net). Eligible are cases with proven or probable infection¹ due to rare, non-endemic fungi. Data collected include demographics, underlying conditions, immunosuppressive medication, clinical presentation, diagnostics, antifungal therapy and outcome. Clinical isolates are collected for centralized identification, susceptibility testing and exchange between collaborators.

Results: To date, 559 valid cases of rare IFD are included in the registry: IFD due to Mucormycetes (n = 241), *Fusarium* spp. (n = 81), rare yeasts (n = 76), dematiaceae (n = 57), and *Scedosporium* spp. (n = 34) are the most frequently reported. Cases were documented by collaborators from 36 countries and in additional 30 countries partners are screening for eligible cases. FungiScope is supported by central labs in India and the Czech Republic since 2003, in Russia since 2012 and in Spain since 2016. Of all cases that were included in the registry, 85% are valid for further analysis. Recently, FungiScope collaborators jointly published results on I) invasive mucormycosis in children analyzed together with cases from the registry study Zygomycosis.net², II) disseminated fusariosis in 10 children³, and III) invasive infections

due to *Saprochaete* and *Geotrichum* spp. in 23 patients⁴. In the latter, antifungal susceptibility profiles of 14 clinical strains of rare yeasts were described.

Conclusion: The clinical relevance and by this the awareness of emerging IFD is increasing. FungiScope is a valuable resource used for collaborative studies on rare IFD. Operating and management of the registry requires considerable effort to ensure high data quality for comprehensive analyses, which provide insights into current clinical management of the diseases and thus, hold the potential to identify strategies for early diagnosis and effective treatment.

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P160 | *Aspergillus* section *Fumigati*—Epidemiological trends. A perspective from a National Reference Laboratory

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Objectives: *Aspergillus fumigatus* is the most frequent agent of aspergilosis and reports on infections caused by this species or its siblings are becoming more frequent, together with the increasing number of at risk patients. Nowadays, due to the rising concerns on emerging antifungal resistance, the epidemiological surveillance for clinical and environmental isolates is mandatory.

The overall objective of the project is to understand the epidemiology of the *Aspergillus* isolates (species and antifungal resistance) collected in the Portuguese National Reference Laboratory through our surveillance system on *Aspergillus*.

Methods: During the period 2013-2017, 117 *Aspergillus* section *Fumigati* isolates were collected at the National Health Reference Dr. Ricardo Jorge, through the surveillance system on *Aspergillus*. Isolates were obtained from different patient samples from 15 healthcare institutions of all country, and from different environmental sources (air or surfaces sampling). All isolates were plated for growth as single colonies on malt extract agar with chloramphenicol. These isolates were identified on the basis of macro and microscopic morphology and through the use of molecular tools. Genomic DNA was prepared from each isolate and the sequencing of the Internal Transcribed Spacers (ITS) regions as well as of the gene coding for calmodulin.

Surveillance of azole resistance was performed firstly using Sabouraud dextrose agar supplemented with itraconazole (ICZ), voriconazole (VCZ), and posaconazole (PCZ). When growth was observed, the minimal inhibitory concentration (MIC) was determined by broth microdilution method. In case of doubt, a specific PCR for detection of