

## Surface Mycoses in Patients under Chemotherapy at the Avicenne Military Hospital of Marrakech

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### Abstract

### Original Research Article

**Objectives:** The aim of this study is to evaluate the prevalence of superficial cutaneous mycosis in patients undergoing chemotherapy followed at the oncology unit of Avicenne Marrakech Military Hospital. Analyze the factors favoring their occurrence. **Patients and methods:** We report a cross-sectional prospective study, including 75 patients from the oncology unit of the Avicenne Marrakech Military Hospital undergoing chemotherapy (all tumors included). Clinical and mycological examinations are performed in these patients, involving 8 locations. **Results:** On all patients included we noted a predominance of the male sex with a sex ratio H / F of 1.5. The average age of the patients was 56.8 years. The risk factors selected are corticosteroids, radiotherapy, chemotherapy and diabetes. The nails and the dander are by far the most collected locations; these two sites represent more than 90% of all samples, the direct examination was positive for 20 samples (58.9%), while the culture was positive for 18 samples (53%). Dermatophytes were the most common group of agents with 83.3%. Then came in second position the yeasts with 16.7%. The crop has revealed different species. *Trichophyton rubrum* is the most incriminated species; this dermatophyte was found in 12 cultures or 66.6%. **Conclusion:** Given these results, it is therefore important to undertake specific measures of prophylactic and curative control against MCS for improving the comfort of life of patients on chemotherapy.

**Keywords:** Chemotherapy; Dermatophytes; yeasts; Skin mycosis.

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## INTRODUCTION

Fungal infections, which are at the forefront of skin infections, represent a frequent dermatological pathology.

Their incidence is significantly increased due to the appearance of immunodepression states caused by certain pathologies or treatments including various chemotherapy protocols. The objectives of our work are:

- To evaluate the prevalence of superficial cutaneous mycosis in chemotherapy patients followed at the oncology unit of the Avicenne Marrakech Military Hospital.
- Analyze the factors that favor their occurrence.
- Identify the responsible fungal flora

## PATIENTS AND METHODS

### Methodology

It is a prospective cross-sectional study, including all patients of the oncology unit of the Avicenne Marrakech military hospital, under

chemotherapy (all tumors included). Clinical and mycological examinations are performed in these patients, involving 8 locations.

### Sampling methods

#### Skin lesions

They are scraped off with a curette, a scraper or a foam scalpel on the periphery of the lesion (on the inflammatory bead), to which is applied a swab previously moistened with sterile distilled water.

#### Onychia

The sample is preceded by the cutting of the periphery of the nail using forceps or scissors, the chips are then collected.

#### Mycological diagnosis

A direct examination of the sample is carried out before cultivation. Indeed, a dermatophyte is confirmed by a positive direct examination and / or a positive culture.

**Direct examination**

The pathological product is deposited on a blade with a drop of lightening liquid, in particular 20% potassium hydroxide, for microscopic observation at objective 10 and then at 40, in phase contrast.

**Culture**

Two isolation media were used: Sabouraud-chloramphenicol medium (SC) and Sabouraud-chloramphenicol-Actidione medium (SCA). These media were prepared in tubes and / or Petri dishes, and were seeded by depositing the sample on the agar at different points. The cultures are then incubated at room temperature between 20-30 C.

A culture observation was done every 48 hours, and four-week incubation was necessary before declaring a negative culture.

**Identification**

The identification of different species of filamentous fungi was based on a set of criteria including: growth rate, macroscopic and microscopic aspects of the colonies after mounting them between blade and lamella in lactophenol blue [1]. The yeasts identification was based on the morphological and physiological characteristics (blastose test) [2].

**RESULTS**

During the study period, 75 patients are included, 525 sites are clinically examined. Out of a total of 15 patients with suspicious lesions (20%), a total of 34 samples are taken.

Among all patients included, we noted a predominance of the male sex (50 H / 25 F) with a sex ratio H / F of 1.5. The average age of patients was 56.8 years with extremes of 42 to 75 years, the median being 58 years.

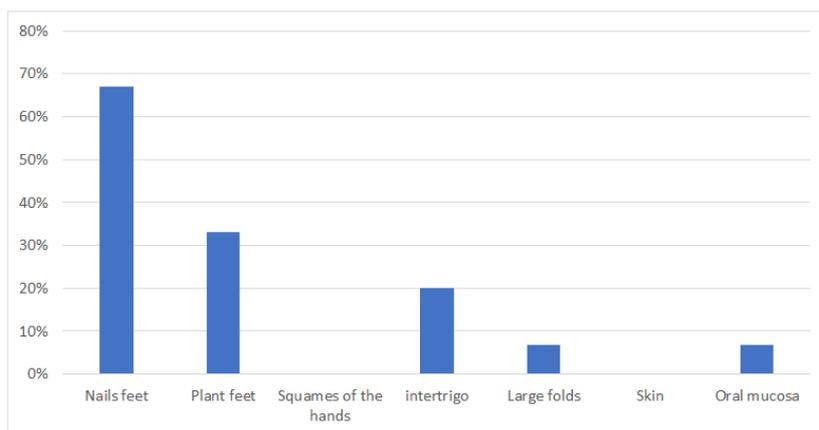
The risk factors for the development of superficial cutaneous mycoses retained are corticosteroids, radiotherapy, and diabetes mellitus (Table I).

The samples taken concerned suspicious lesions. The feet nails and the feet dander are by far the most collected locations; these two locations represent more than 90% of all samples, while no suspicious lesions were found at two locations; the glabrous skin and the scalp. The following diagram shows the distribution of samples by location (Figure 1).

The direct examination was positive for 20 samples (58.9%), while the culture was positive for 18 samples, a percentage of 53%.

**Table-I: Distribution of risk factors in patients with suspicious lesions**

	NUMBER	%
DIALYSIS	0	0
CORTICOSTEROIDS	13	81.2
RADIOTHERAPY	7	43.7
DIABETES	0	0
SURGERY	12	75



**Fig-1: Distribution of samples according to the locations**

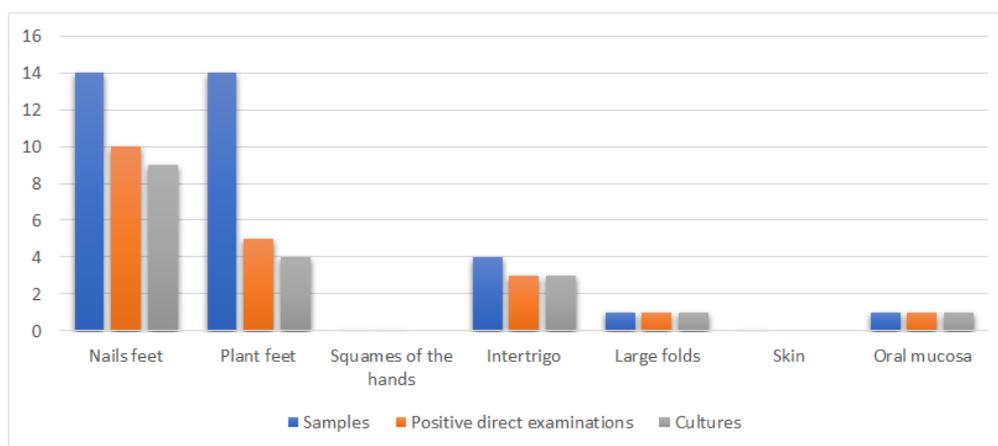
The number of patients having positive samples is 15, a prevalence of 20%. The following diagram shows the distribution of samples, positive direct examinations and positive cultures by location (Figure 2).

Dermatophytes were the most common group of agents (83.3%). Then come in second place the yeasts (16.7%).

Different species have been revealed by the culture. *Trichophyton rubrum* is the most incriminated

species, it was found in 12 cultures or 66.6% of all positive cultures, followed by *Trichophyton mentagrophytes* and *Candida albicans* in 3 cultures each (16.7%).

For foot nail samples, *Trichophyton rubrum* was isolated from seven cultures, *Trichophyton mentagrophytes* in two crops. *T. rubrum* was the most incriminated dermatophyte in foot dander samples (4 crops). *Candida albicans* has been isolated in oral cavity and folds (inguinal and interdigito-plantar).



**Fig-2: Distribution of samples, positive direct examinations and positive cultures by location**

## DISCUSSION

After a deep literature search, we did not find a study similar to ours, despite the seriousness of these infections in this type of patients. As a result, we decided to compare our results with other studies in patients having other immunodeficiency causes and with the general population.

The average age of our patients as well as the sex ratio H / F is consistent with those found in these studies. Lower results were found in a national series on the general population. This may be explained by the incrimination of pediatric patients in this study (Table II).

The prevalence of superficial mycotic infections in our study is 20%. Elsewhere in Africa, in a Tunisian study, Chaker and al. had obtained a superior result to ours with 53.7% superficial mycosis [7] while in an intertropical zone (Brazil) a prevalence of 50.6% was found [8]. In Europe, more particularly in Malta, in France and in Turkey prevalences of 32%, 63.1% and

70% respectively were obtained [9-11]. Malta's prevalence is close to our result while those obtained in the other two European countries are much higher than ours. This seems contrary to the observations which stipulate that in tropical zones, due to their hot and humid climate, superficial mycoses are more frequent than in temperate zones [12].

However, these values found in these two countries could, on the one hand, be explained by the important migratory phenomena in these two countries, which are among the European countries that welcome the most immigrants, particularly African, and, on the other hand, by the socio-economic conditions in these countries far in advance compared to ours in development. However, regardless of the geographic area, the most prominent superficial mycosis agents in descending order are dermatophytes, yeasts and molds [9, 12, 11]. Our results are perfectly in phase with this observation. Regarding the dermatophytes, the most found species vary according to the geographical area [13].

**Table-II: epidemiology of the age of our patients according to the authors**

	Average age	Sex ratio M/W
ZIDA ET AL [3]	42	0.89
ABOUNOUH [4]( immunosuppressed)	49,9	1.45
KAMIL [5] (general population)	32	0.7
DIONGUE [6] (general population)	31	0.4
Our study (2018)	56,8	1,5

The predominant dermatophyte in our study is the *T. rubrum*, cosmopolitan species. This result confirms what has been found before by other studies in Morocco (Table III), in Tunisia, Turkey, China, France,

Brazil, Malta and French Guiana [8-15]. The yeasts found remain dominated by the genus *Candida* and the species *C. albicans*, probably linked to their wide

distribution and their commensal character, despite the

emergence of other genera as *Trichosporon*.

**Table-III: Epidemiology of germs according to the authors**

	<i>Trichophyton rubrum</i>	<i>Trichophyton mentagrophytes</i>	<i>Candida albicans</i>
ABOUNOUH [4] (immunodéprimé)	85,71%	6,12%	2,04%
KAMIL [5] (population générale)	70.1%	1.002%	10.9%
Notre étude (2018)	66,6%	16,7%	16,7%

The *Malassezia*'s absence in this study does not reflect the true epidemiological reality. Indeed, malassezioses remain mostly neglected: these affections are clinically very frequent in Morocco but have very little consultation or mycological diagnosis.

## CONCLUSION

We report a low overall prevalence of superficial cutaneous mycosis (SCM) in patients receiving chemotherapy. On the other hand, our results confirm the conclusions of previous studies according to which immunosuppression would be a favorable factor in the occurrence and the development of SCM, especially those due to some fungal species such as *T. rubrum* and *C. albicans*. Given these results, it is therefore important to undertake specific measures of prophylactic and curative control against SCM for improving the life comfort of patients on chemotherapy.

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