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SHORT COMMUNICATION/COURTE COMMUNICATION

# Oral infections caused by yeasts in patients with head and neck cancer undergoing radiotherapy. Identification of the yeasts and evaluation of their antifungal susceptibility

*Infections orales causées par des levures chez des patients atteints de cancer de la tête et du cou et soumis à la radiothérapie. Identification des souches isolées et évaluation de leur sensibilité aux antifongiques*

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## KEYWORDS

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Cancer treatment;  
Radiotherapy;  
Oral candidiasis;  
Antifungal susceptibility

**Summary** Yeasts occur as part of the normal human microbiota. Nevertheless, some species are opportunistic, affecting immunocompromised patients such as those undergoing oncologic treatment.

**Objective.** – To detect the presence of yeasts in patients suffering from head and neck cancer who are receiving radiation therapy and display lesions in the oral cavity, compatible with candidiasis; and to evaluate the antifungal susceptibility of the isolates recovered.

**Methods.** – Sixty samples from patients were obtained by swabbing the oral mucosa. Identification of isolates were performed by classical taxonomic, morphological and biochemical methods as well as by using commercial identification kits. Susceptibility to antifungal drugs was determined by the agar diffusion method with Neosensitabs<sup>®</sup> disks.

**Results.** – Forty-six samples (77%) yielded positive findings, and species recovered were: *Candida albicans* (22 isolates), *Candida tropicalis* (13 isolates), *Candida parapsilosis* (six strains), *Candida krusei* (three strains), *Candida dubliniensis* and *Saccharomyces cerevisiae* (one each).

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**MOTS CLÉS**

Cancer de la tête et du cou ;  
 Traitement du cancer ;  
 Radiothérapie ;  
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 Sensibilité aux antifongiques

All strains were susceptible to itraconazole, clotrimazole, voriconazole, nystatin and amphotericin B. On the other hand, 65% of strains were miconazole-susceptible while 35%, showed intermediate susceptibility. With regard to ketoconazole, only three strains (7%) corresponding to *C. albicans* (one isolate) and *C. krusei* (two isolates) displayed intermediate susceptibility. Only *C. krusei* strains were resistant to fluconazole while all the other species were susceptible. Eventually, only six isolates (13%) were susceptible to terbinafine while the remaining strains were resistant in vitro.

**Conclusion.** – Early detection of etiological agents causing lesions, as well as the evaluation of their susceptibility to commonly used drugs, are crucial in order to choose the appropriate treatment that will minimize complications while improving the quality of patients' lives.

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**Résumé** Les levures s'intègrent au milieu ambiant habituel humain. Cependant, certaines espèces sont opportunistes et s'attaquent à des patients immunodéprimés, comme ceux recevant un traitement oncologique.

**Objectifs.** – Détecter la présence de levures chez des patients atteints de cancer de la tête ou du cou recevant un traitement radiothérapeutique et qui présentent des lésions de la cavité orale compatibles avec une candidose et évaluer la sensibilité antifongique des souches isolées.

**Méthodologie.** – Les prélèvements de la muqueuse buccale ont été effectués par écouvillonnage chez 60 patients. L'identité des espèces isolées a été confirmée par des méthodes taxinomiques classiques et aussi par un système d'identification commercial. La sensibilité aux drogues antifongiques a été évaluée selon la méthode de diffusion en gélose à l'aide de disques Neosensitabs®.

**Résultats.** – Un total de 46 échantillons (77 %) a montré des cultures positives: 22 cas de *Candida albicans*, 13 de *Candida tropicalis*, six de *Candida parapsilosis*, *Candida krusei* chez trois patients, et respectivement un seul cas de chaque: *Candida dubliniensis* et *Saccharomyces cerevisiae*. Toutes les souches étudiées se sont montrées sensibles à l'itraconazole, au clotrimazole, au voriconazole, à la nystatine et à l'amphotéricine B. Face au miconazole, 65 % des isolements se sont avérés sensibles, 35 % ont montré une sensibilité moyenne. Quant au ketoconazole, seulement trois souches (7 %) – une souche de *C. albicans* et deux souches de *C. krusei* – ont montré une sensibilité moyenne. Face au fluconazole, les souches de *C. krusei* sont les seules à s'être montrées résistantes, mettant en avant la sensibilité des autres. Finalement, seulement six isolements ont mis en évidence une sensibilité à la terbinafine (13 %) le reste étant résistant.

**Discussion.** – La détection précoce des agents étiologiques des lésions est fondamentale et l'étude de leur sensibilité aux médicaments couramment utilisés, en vue d'établir le traitement adéquat, permet la diminution de complications et l'amélioration de la qualité de vie des patients.

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**Introduction**

Yeasts are part of the normal microbiota in human skin and mucosae. They constitute the flora of a high number of healthy individuals. However, some species display an opportunistic behaviour shifting from a non-pathogenic commensal microorganism to a tissue colonizing fungus leading to a variety of clinical manifestations in patients with predisposing factors. Among immunologically compromised patients, those subjected to different oncologic treatments represent a relevant group to be considered, due to their propensity to develop opportunistic infections. The clinical importance of infections caused by the genus *Candida* amid these patients has been on the rise during the last decades [15]. It is certain that oropharyngeal candidiasis (OPC) is the most frequent fungal opportunistic infection in immunologically compromised patients [1]. It is important to bear in mind that mucocutaneous forms, among which OPC is included, may evolve into disseminated forms when proper actions are not implemented. In recent years, the incidence of invasive

candidiasis has increased dramatically [17,24], along with a marked increase in the isolation of strains resistant to commonly used drugs [24].

Although *Candida albicans* is the most frequently recovered species [8,18], there are other species in this genus such as *Candida tropicalis*, *Candida dubliniensis*, *Candida parapsilosis*, *Candida glabrata*, *Candida krusei*, among others, as well as non-*Candida* yeasts, including *Saccharomyces cerevisiae*, which are also associated to clinical manifestations [21,22].

Patients subjected to radiotherapy in head and neck represent a serious challenge in relation to the post-treatment oral complications derived from radiation therapy [10,25]. The challenge is even greater if we consider that the oncology, biochemical and dentistry services in many health systems do not operate in an integrated manner, a situation that hinders the coordinated function of the health team. Such coordinated work is key for oncology patients to experience minimal complications inherent to their own disease, as well as to the aggressive treatments they must

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