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ORAL *CANDIDIASIS* AMONGST CANCER PATIENTS AT QODS HOSPITALS IN SANANDAJ

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ABSTRACT

Background: Within the past two decades, *Candida* species have emerged as major human pathogens and are currently the fourth most common cause of nosocomial infection. Propose of this study was to determine the occurrence of oral Candidiasis among cancer patients at Qods hospitals in Sanandaj.

Materials and Methods: Sixty cancer patients were examined for oral candidiasis. For all patients, the clinical diagnosis had to be confirmed microbiologically by the presence of yeasts and / or hyphae or pseudohyphae on potassium hydroxide–treated smears of oral swabs. Oral samples were obtained and cultured on Sabouraud's dextrose agar and CHROMagar.

Results: 25 out of the 60 patients (41.7%) were males and 35 (58.3%) were females ranging in age from 15 to 79 years. Gastro-intestinal cancer and Breast cancer were the most frequent cancer in the studied group, accounting for 65 % and 18.4 % respectively. The mean weight of the patients was 52.67 Kg (range, 38– 80 Kg). Similarly, the mean of hospital stay was 3.58 days (range; 1-9 days).

From these patients, 19 Candida spp were isolated; *C. albicans* alone outnumbered other species and accounted for 73.68% episodes of trash.

For *C. albicans* isolates, the MIC values ranges from 1 to 9 µ g / ml µg / ml for polyenes and from 0.03 to 16 µ g / ml for the azole antifungals. All the *Candida albicans* had closely related MFCs values.

Conclusion: In conclusions, the finding of our study strongly suggest that oral candidiasis is a frequent complication among cancer patients, being *C. albicans* the main etiological agent.

Keywords: Cancer, Oral candidiasis, *Candida albicans*, Antifungal agents

INTRODUCTION

The ubiquitous *candida spp* are important cause of oropharyngeal candidiasis and nosocomial infections including life threatening infections among cancer patients. Indeed oropharyngeal candidiasis is a common infection in cancer patients and ranks as the most common fungal diseases [1]. Among *candida spp*, the most frequently encountered clinical problem is caused by *C. albicans* [2]. Actually many people are colonized by *Candida spp* as a commensal organism. For this reason, cancer patients must be strictly monitored for the clinical presence of yeast.

The use of broad – spectrum antibiotics, steroids, or other immunosuppressive agents, diabetes mellitus, cancer patients and organ transplantation can increase the risk for candidal infections [3]. The prevalence of oral candidiasis in various countries varies among studies according to location, age of the patients, and the site sample, and has been reported to range from 20- 75% [4]. The incidence of Candida spp isolated from the oral cavity has been reported to be 45 % - 65% in children, 50-65% in people with removable dentures, 65-88% in those residing in acute and long term care facilities, 90% in patients with acute leukemia, 95% with HIV [4-6]. Among cancer patients, infection can spread through the bloodstream, leading to sever infection with significant morbidity and mortality [7]. A routine oral examination of cancer patients has revealed a greater incidence of Candida infections than that in most types of patients. Almost all surveys on fungal infections in cancer patients come from USA, Europe, and other developed countries, and little is known about this problem in developing countries particularly Iran. For the first time we report on occurrence rate of oral *Candidiasis* among cancer patients at Qods hospitals in Sanandaj and in-vitro susceptibility to antifungal agents were also determined.

MATERIALS AND METHODS

This study was conducted over a period of 16 months at Qods hospital of the Kurdistan University of Medical Sciences. Patients who had developed oral thrush and were treated at the department of medical oncology were eligible for the study.

All the patients had different types of cancers and after taking the sample, had received different types of chemotherapy / radiotherapy prescribed by attending physicians. Oral candidiasis was clinically diagnosed by investigator. The clinical diagnosis was based on lesions clinically recognized as creamy, whitish, curd-like plaques or pseudomembranes involving the oropharyngeal mucosa and the tongue. For all patients, the clinical diagnosis had to be confirmed microbiologically by the presence of yeasts and / or hyphae or pseudohyphae on potassium hydroxide–treated smears of oral swabs. Swab was also used for yeast cultures on plates with Sabouraud dextrose agar. Cultures were considered positive if ≥10 CFU appeared on the plate. Candida spp were identified by classical methods [8]. The differential medium Chromagar Candida was used to confirm the results by colony morphology and pigmentation according to the manufacture's instructions.

Minimum Inhibition Concentration (MIC) was determined by serial broth dilution method [9]. Briefly, a serial dilution was made from the stock solution of the antifungal agents to have the final concentration ranges from 0,03 to 16 µg / ml for amphotericin B, Ketoconazole and miconazole; 0.125 to 64 µg / ml for fluconazole, and 0.7 to 18.5 µg / ml for nystatin.

The prepared inocula of *Candida spp* were incubated with different antifungal concentration at 30^0C.

Aliquot from each isolate showing inhibition was inoculated on the surface of SDA plate and incubated at 30^0C for 24 – 48 hours to determine the MFC of the respective antifungal agent.

RESULTS

During a 16 months period (March 2009 to September 2010), 60 patients from Qods hospital in Sanandaj were analyzed for oral *Candidiasis* among cancer patients. Twenty five out of the 60 patients (41.7%) were males and 35 (58.3%) were females ranging in age from 15 years to 79 years.

Gastro-intestinal cancer and Breast cancer were the most frequent cancer in the studied group, accounting for 65 % and 18.4 % respectively. The mean weight of the patients was 52.67 Kg (range, 38– 80 Kg). Similarly, the mean of hospital stay was 3.58 days (range; 1-9 days).

From these patients, 19 Candida spp were isolated; *C. albicans* alone outnumbered other species and accounted for 73.68% episodes of trash.

For *C. albicans* isolates, the MIC values ranges from 9 to 18 µ g / ml for polyenes and from 16 to 64 µ g / ml for the azole antifungals. All the *Candida albicans* had closely related MFCs values.

TABLE 1: DEMOGRAPHIC CHARACTERISTICS OF CANCER PATIENTS WITH CANDIDIASIS

Patient characteristic	
Sex	No. (%)
Male	25 (41.7)
Female	35 (58.3)
Age (years)	
Range	15 – 79
Mean	49.88
Weight (Kg)	
Range	38-80
Mean	52.67
Days admitted in hospital (days)	
Range	1-9
Mean	3.58
Cancer type	
GI	39 (65)
Lung	6 (10)
Breast	11 (18.4)
Head and Neck	2 (3.3)
Others	2 (3.3)
Total	60

TABLE 2: FREQUENCY OF ISOLATION OF *CANDIDA SPECIES* FROM 60 CANCER PATIENTS WITH ORAL CANDIDIASIS

Candida spp	**Number (%)**
Candida albicans	14 (73.68)
Candida krusi	05 (26.32)
Total	19 (100)

DISCUSSION

Candidal infections are a major problem in the world, especially among the cancer patients [10-11]. The epidemiology of *C. albicans* and other yeasts from the oral cavity of patients with cancer is quite varied.

Our patient population consisted of 60 individuals with seven different types of cancers. Gastro-

intestinal cancer and Breast cancer were the most frequent cancer in the studied group, accounting for 65 % and 18.4 % respectively which is in accordance to other investigation [12].

TABLE 3: MIC AND MFC PROFILE OF *CANDIDA SPP.* ISOLATED FROM CANCER PATIENTS WITH ORAL CANDIDIASIS

Antifungal agents	**MIC** **MFC**	***C. albicans***
Amphotericin B	**MIC** **MFC**	**16 µ g / ml** **≤ 16 µ g / ml**
Nystatin	**MIC** **MFC**	**≥9 -18 µ g / ml** **≤ 18 µ g / ml**
Fluconazole	**MIC** **MFC**	**≥ 32 -64 µ g / ml** **≤ 64 µ g / ml**
Ketokonazole	**MIC** **MFC**	**16 µ g / ml** **≤ 16 µ g / ml**

Results obtained in this study established several points pertinent to the prevalence of oral candidiasis consistent with published data [13-14]. Nineteen Candida spp were isolated from the oral cavity of 60 cancer patients. As shown in Table 2, *C. albicans* alone outnumbered other species and accounted for 73.68% episodes of oral candidiasis. Our findings were consistent with that noted by other investigators [15-16].

Bagg et al. [17] showed that patients with advanced cancer have demonstrated a high incidence (51%) of oral colonization with non-*C. albicans* yeasts [18].

Antifungal drug resistance of Candida spp continues to increase in response to the widespread of application of antifungal agents in treatment of cancer patients. MIC and MFC data for the two polyenes (amphotericinn B and nystatin) and for the two azoles (flucobazole, and Ketoconazole) are in general agreement with others studies conducted in close geographical regions [19-20].

In conclusions, the finding of our study strongly suggest that oral candidiasis is a frequent complication among cancer patients, being *C. albicans* the main etiological agent; Most isolates of *Candida spp.* tested were very resistant to Polene as well as azole groups. The frequent occurrence of *Candida albicans* in oral cavity of cancer patients indicates a need for effective management of the infection prior to any anticancer treatment, as severe complications can otherwise result.

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