

# Correlation between fungi isolated from burn wounds and burn care units

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## Abstract

A comparison was made prospectively between fungal isolates from patients and burn care units. *Aspergillus niger* was the most frequent isolate in both patients and burn care units whereas *Ulocladium* was the commonest isolate in the control group. *Aspergillus terreus*, *Penicillium* and Zygomycetes, which were recovered from burned patients, were also found more frequently in the burn care units than in the control group (other areas in the hospital). These findings indicate a potential risk of fungal infection which can be acquired from the immediate surroundings of patients in burn care units. Periodical burn ward decontamination is therefore recommended. © 1999 Elsevier Science Ltd. All rights reserved.

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## 1. Introduction

Immunocompromized burned patients may acquire fungal infection from the surrounding environment in the burn care unit. On the other hand, patients infected with fungi may disseminate these agents to their surroundings. This generates a considerable risk to all patients staying in the burn wards. Fungal burn wound infections were found more commonly in patients treated with open dressing methods than in patient treated with occlusive dressing methods [1]. As a result of these observations this study was undertaken to investigate the sources of fungal infection in burned patients.

## 2. Materials and methods

A prospective study extended from March 1996 to August 1997. Fungal burn wound infection was regarded as positive when the growth on culture was moderate or heavy or when the same fungus was obtained from several sites on the wound or on several

occasions, or when direct microscopical examination revealed the fungus. Specimens for fungal culture were also obtained from burn care units and from places away from burn care units as control isolates. The control specimens were collected from clinical areas in the same hospital but not from the burns ward. The specimens of burn wards and control places were collected by swabbing different surfaces and by exposure plating for 1 h. The swabbing was made from dust which had settled on furniture, shelf roof, wall and electricity wires. The isolated fungi from burn care units and from control places were determined as one isolate per plate, whether these isolates were one colony or more. The following media were used for isolation of fungi: Sabouraud dextrose agar, potato–carrot agar and potato–dextrose agar. All these media were supplemented with gentamicin and chloramphenicol. A comparison was made between fungal isolates of patients, burn care units and control places. Fungi were identified using conventional methods [2–8].

## 3. Results

The total number of beds at the hospital is 500, of which 40 are burn beds. One hundred and thirty-two

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Table 1  
Fungal isolates from patients, burn wards and control places

Fungus	No. isolated from patients	No. isolated from burn wards	No. isolated control from places
<i>Aspergillus niger</i>	8	15	6
<i>Aspergillus flavus</i>	4	0	2
<i>Aspergillus fumigatus</i>	2	6	6
<i>Aspergillus terreus</i>	2	10	1
<i>Zygomycetes</i>	3	9	2
<i>Penicillium</i> sp.	3	5	2
<i>Candida krusei</i>	5	0	0
<i>Candida tropicalis</i>	3	0	0
<i>Candida albicans</i>	2	0	0
<i>Candida</i> sp.		1	1
<i>Fusarium</i> sp.		1	0
<i>Aspergillus nidulans</i>	1	1	1
<i>Ulocladium atrum</i>		0	7
<i>Alternaria alternata</i>		8	6
<i>Nigrospora sphaerica</i>		6	0
<i>Chrysosporium</i> sp.		1	3
<i>Cladosporium cladosporoides</i>		2	3
<i>Papulospora</i> sp.		1	0
<i>Drechslera</i> sp.		3	2
<i>Acrophialophora fusispora</i>		1	0
<i>Emericella nidulans</i>		1	0
<i>Stachybotrys cylendrospora</i>		1	0
<i>Acremonium murorum</i>		2	0
<i>Chaetomium globosum</i>		1	2
<i>Volutella</i> sp.		1	0
<i>Cunninghamella bertholletiae</i>		1	0
<i>Trichoderma viride</i>		0	2
<i>Sporothrix</i> sp.		0	2
Total	32	77	48

patients were examined for fungal and bacterial infection. There were 28 patients infected with fungi (21.2%). All cases were infected with bacteria except one case which was infected with *Candida* alone.

*Aspergillus niger* was most frequent isolate in both patients and burn care units, whereas *Ulocladium* was the most common isolate in control places Table 1.

*Aspergillus terreus*, *Penicillium* sp. and *Zygomycetes* were more common in burn wards than in control places. All these fungi were recovered from burned patients. Three species of *Candida* were recorded for patients but not found in the burn unit or in control areas.

#### 4. Discussion

In this study, *A. niger* was the most common isolate in patients and burn care units. This indicates a potential risk of acquiring fungal infection from the immediate surroundings in burn care units. This supports the finding of Chakrabarti et al. [9] who have emphasized on the pathogenic potential of some of the environmental fungal isolates located in the vicinity of burned patients.

Some fungi (*A. terreus*, *Penicillium* sp., *Fusarium* and *Zygomycetes*) were found more commonly in

burn wards than in control sites and all of these fungi were previously reported to be causative agents of burn wound infection [10–13]. Therefore, these fungi, that settled in the vicinity of immunosuppressed burned patients, may cause serious burn wound infection.

There was higher incidence of fungi in the burn unit environment compared to the rest of the hospital. This may be the result of dissemination of these fungi from burned patients to their surroundings and subsequent reinjection of the same to other patients. The humidity and hot weather in Basrah city almost certainly supports growth and dissemination of fungi in the burn care unit and burned patients.

In view of the findings of the present study, it is recommended that a regular decontamination of burn wards is carried out, particularly when fungal burn wound infection of patients is recognized.

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