

Fungal elements isolated from stretchers of the Clinic of the Uniabeu University Center Physiotherapy School

¹ Suelen Anacleto Coelho, ^{1,2} Jose Tadeu Madeira de Oliveira, ¹ Mauro Fontes Perestrelo, ¹ Edgar Santos Coelho Júnior, ¹ Nelson Ayres Barradas, ^{1,3} Antonio Neres Norberg

¹UNIABEU University Center, Rio de Janeiro, Brazil

²Benjamin Constant Institute, Rio de Janeiro, Brazil

³Souza Marques Medicine School– FTESM, Sao Carlos Metropolitan School – FAMESC, Rio de Janeiro, Brazil

Abstract- Despite many efforts in preventing the transmission of pathogens in health care facilities, little has been done related to the potential of contamination and transmission of microorganisms between users on health services. Fungal elements may be important sources of contamination in physiotherapy ambulatory. The aim of this research is to identify fungal elements on physiotherapy clinic stretchers. Methodology: sterile swabs embedded in sterile saline solution were used to collect the material, which were rolled in zigzag movements over the entire surface of 60 stretchers from the Clinic of the UNIABEU University Center Physiotherapy School. The material was seeded in Petri dishes containing the media Sabouraud dextrose agar and Mycosel culture. The plates were sealed with adhesive tape and maintained at room temperature ($\pm 30^\circ\text{C}$). Colonies of filamentous fungi in microcultures were identified by cultural and morphological characters and yeasturiform fungi by Gram staining and biochemical tests. The following fungi were isolated: *Penicillium* spp. 15 (25%), *Aspergillus fumigatus* 4 (6.7%), *Aspergillus niger* 4 (6.7%), *Trichophyton rubrum* 3 (5%), *Rhodotorula* spp. 3 (5%), *Fusarium* spp. 2 (3.3%), *Cladosporium* spp. 2 (3.3%), *Epidermophyton floccosum* 1 (1.7%). There was a particularly high number of fungal pathogens species as contaminants of the examined stretchers, which can be considered as possible sources of contamination if there isn't an efficient cleaning at the gap time between the use within the patients. Monitoring should be done mainly in the clinics intended to immunocompromised patients, who are more sensitive to develop infections by environmental pathogens or coming from the health professionals.

Index Terms- fungal elements, stretchers, health facilities, nosocomial infections

I. INTRODUCTION

Nosocomial infection occurs when the source of contamination is the hospital environment. In this environment, the proximity between health professionals and patients offers favorable conditions for the transmission of pathogens through contact with contaminated organic secretions or fluids, medical instruments and devices or inanimate contact surfaces. The pathogenic microorganisms contained in these sites may survive for long periods at the environment waiting for an opportunity to infect a susceptible host^{1,2}.

Nowadays, researchers and health professionals directed their attention for an implementation of preventive measures in order to avoid the transmission of pathogens in hospital environment or outpatient care facilities. Many factors influence the risk of microbial transmission in health care services, including conditions as individual characteristics of the people, care intensity, invasive procedures, exposure to environmental sources, among others³. In this sense, the maintenance of a biologically safe environment is essential to the prevention of cross contamination, and the hands of health professionals are recognized as the most common pathway of pathogen transfer. Generally, the environment occupied by colonized or infected patients may become contaminated. Under these conditions, inanimate surfaces and equipment are identified as potential reservoirs of microorganisms, including those resistant to antimicrobials.

There is a progressive increase in hospital infection rates due to fungal elements, a raising number of cases and high rates of morbidity and mortality^{4,5}. Part of these fungal infections are from endogenous origin, while others can be exogenously acquired, transmitted by health professionals, contaminated injectable solutions, biomaterials and inanimate environmental sources^{3,6,7}. The objective of this research was to isolate and identify the fungal elements contaminating the surface of the stretchers used for examination and procedures of the outpatient clinic of the UNIABEU University Center Physiotherapy School.

II. MATERIAL AND METHODS

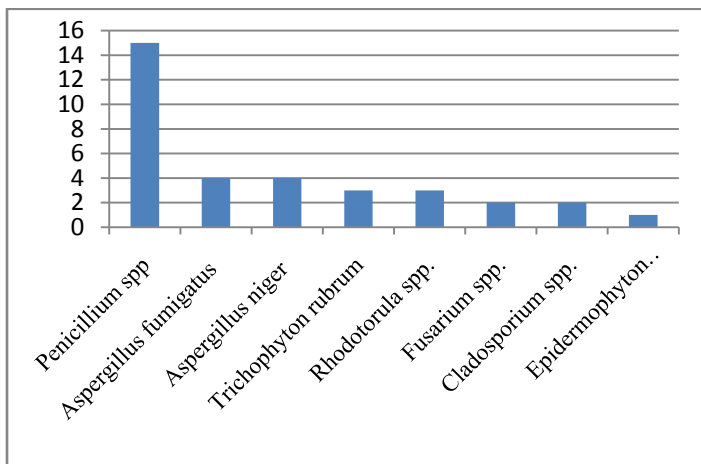
Sterile swabs embedded in sterile saline solution were used for the collection of the material, which were rolled in zigzag movements over the entire surface of 60 stretchers used in the physiotherapeutic procedures of the clinic-school of the Physiotherapy School Clinic of the UNIABEU University Center. The material was seeded in Petri dishes containing the media Sabouraud-dextrose-agar and Mycosel. The plates were sealed with adhesive tape and kept at room temperature ($\pm 30^\circ$). Colonies of filamentous fungi were identified in microcultures by morphological and cultural characters, and yeasturiformes fungi by Gram staining and biochemical tests through BioMerieux Vitek system.

III. RESULTS

From the cultures of the material collected from the

surfaces of the stretches, the following fungal elements were isolated: *Penicillium* spp. 15 (25%), *Aspergillus fumigatus* 4 (6.7%), *Aspergillus niger* 4 (6.7%), *Trichophyton rubrum* 3 (5%), *Rhodotorula* spp. 3 (5%), *Fusarium* spp. 2 (3.3%), *Cladosporium* spp. 2 (3.3%), *Epidermophyton floccosum* 1 (1.7%).

Graphic 1- Number of fungi species by stretches found in 60 examined stretches of the Clinic of the Uniabeu University Center Physiotherapy School.



IV. DISCUSSION

Although the importance of the study of the stretch's surfaces in the epidemiology of hospital and outpatient facilities infections was clarified, few studies about fungal monitoring and hygiene of these environments were found.

According to Honorato³ and Coura⁵, we daily live in contact with a large number of genus and species of fungi and most of these do not cause problems in healthy individuals, but in immunocompromised patients they can become devastating. In the hospital environment, there are often immunocompromised patients, making this environment a risk place depending to the levels of fungal contamination. Basic diseases such as malnutrition, cancer, infections or specific conditions, also procedures that include surgeries, intubation, transplanted, prolonged administration of medications, make these previously debilitated patients more vulnerable to opportunistic fungal infections. The authors also considered that cleaning of the health care outpatient clinics and hospital environment is the best way to control levels of fungal contaminants when performing with the correct procedures. The ideal procedure would be that in the act of this cleaning an ambient sterilization be performed, which is not possible. Therefore, the effectiveness of the cleaning process shall promote the greater safety of the environment as possible, lowering the risks of fungal contamination to the patients and health professionals. According to our results and observations, we can corroborate the idea of these authors.

According to the control of the transmission of pathogens in health care facilities, we agree with the indications of the

researchers Oliveira & Damasceno⁸ when affirming that besides the cleaning and disinfection of surfaces and equipment, the cleaning of the hands excel for the guarantee of safe care. The hands of healthcare professionals and people who move in the hospital environment are an important pathway for disseminating pathogens between patients, visitors and health professionals to the environment and vice versa. However, hand sanitation have not sufficient observance among health professionals, probably due to multiple attributions, difficulties in accessibility to lavatories, level of knowledge, motivation, belief, among other reasons.

The hygienization of health care sectors aims to remove dirt with the application of germicidal substances and friction, thus preventing the microorganism dispersion which is on the surfaces of the furniture. However, when the disinfection of the surfaces have failures, they only move the dirt from one place to another and the microorganisms remain on the surfaces, persisting the source of contamination^{2,9,10,11}. We suggest that health and cleaning professionals must be trained to rectifying their habits in order to reduce the levels of hospital or outpatient infection both through direct contact with patients as through the manipulation of inanimate objects that may become sources of infection in the sector of physiotherapy.

V. CONCLUSIONS

A high number of pathogenic fungi species was found, contaminating the examined stretchers, and it may be considered as possible infection sources when there is no sufficient or adequate cleaning in the gap between patients treatment. The pathogen monitoring should be performed mostly in immunocompromised specialized outpatients, which are more susceptible to develop infections by ambient pathogens, health professional transmitted or hospital-linked infections.

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