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RESEARCH ARTICLE

MICROBIAL BIO-BURDEN IN HEALTH COLLEGES AT NAJRAN REGION, SOUTHWEST OF SAUDI ARABIA

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ABSTRACT

The experiments aimed to describe the Types and the density of bacterial species and fungi on the surface of small sized clinics, clinical laboratories, classrooms and halls. One hundred and sixteen samples were collected using sterile cotton swabs that are soaked in sterile peptone water broth and the swabs were rubbed into a quarter of 20cm² on the surfaces. After cultivation of the samples on appropriate growth, media a series of steps for purification and identification of microbial species were conducted. The surfaces within the clinics and the laboratories showed high microbial burden. *Staphylococcus aureus* and the *Sphingomonas paucimobilis* were the microorganisms most frequently found on the surfaces. Cleaning and sterilization of the surfaces reduce the microbial content largely.

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INTRODUCTION

The bacteria and fungi have an ability to colonize the surfaces of the objects. Some studies have shown that the ability of these microorganism to persist for weeks on stainless steel surfaces and all polymeric materials that are used to fabricate most touch surfaces in hospitals and laboratories (Burke, 2013) The Hhealthcare-Associated Infections (HAIs) are frequent complications occurring in healthcare facilities and represent a problematic concern regarding the safety and quality of healthcare over the world (Allegranzi, 2011) An other study conducted by European Center for Disease Control (ECDC) confirmed that health care associated infections are a major public health problem in Europe with a prevalence of 5.7% (4.5–7.4%) .According the data from these studies, the total number of patients with HAI in European acute care hospitals during 2011–2012 was 3.2 million, with a wide confidence interval .9-5.2 million patients. Reports in United States recorded similar incidences (Klevens *et al.*, 2002). The surfaces really act as reservoirs for wide range of bacteria like *S.aureus*, *E.coli* and contribute to the transmission of these pathogens. It is a real controversial question is the qualitative and the quantitative role of the environment in the patient infection, especially the confinement and furnishing surfaces. In order To reduce these risks, sanitation procedures could be applied to all surfaces that contact directly or indirectly the people. Although presence of experimental evidences recommended use of the disinfectants but their routine use is still controversial (Rutala, 2015; Dettenkofer, 2017) so a proper surface disinfection is recommended by all international

guidelines as an important procedure for controlling the infections to great extent (Rutala, 2017) There is an essential evidence for the benefits of hospital cleanliness towards reducing HAIs (Mangram *et al.*, 1999) The surfaces cleanliness is a different case from patient to patient infections and the proper cleaning and disinfection are effective methods to reduce the number of pathogens.

MATERIALS AND METHODS

Study design

Cross sectional community, based case study was conducted to now the prevalence rate of microorganism in some area in medical collages at Najran University as well as in the student Wight coat.

Microbiological tests

The samples were collected from various surfaces such as doors handles, walls, windowsills, sinks and benches. All samples processing were cultured in the following culture media (McConkey agar, Salmonella Shigella agar, Nutrient agar and Sabouraud Dextrose agar (SDA) with chloramphenicol the sample was incubated in incubator at 37C for 28-48 hours with daily observation.

Statistics

The samples processing was performed in duplicates and triplicates. Simple Statistical analysis was done using SPSS version 20.0 software.

and this spot the light on a fact that beside the person to person microbial transmission, the surfaces of the objects provides a potential way for microbial transmission (Kramer, 2016)

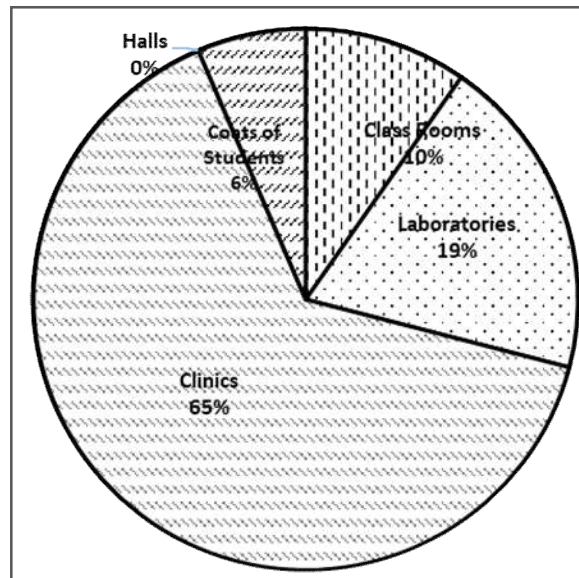


Fig. 1. The relative abundance of the microbial growth among the objects

Table 1. Distribution of the samples in relation to their locations

Location	No of samples	No. of positive sample for microbial growth	Percentage (%) of positive samples.
Class Rooms	25	3	8.2
Laboratories	25	6	4.1
Clinics	21	20	95
Halls	25	-	0
Coats of Students	20	2	10
Total	116	31	26

Table 2. Distribution of the microbial species among the sites of isolation

Site of isolations of microorganisms	The microbial species	Location (Faculties)
1. Class rooms : surfaces, handles and doors	<i>Staphylococcus hominis</i> , <i>Bifidobacteria sp.</i> , <i>Sphinomonas paucinobihis</i> , <i>Aspergillus niger</i>	AMS, Pharmacy, Dent., Medicine and Nur.
2. Clinical Laboratories: Surfaces and door handles	<i>Staphylococcus aureus</i> , <i>Streptococcus pneumonia</i> , <i>Sterptomycus sp.</i> , <i>Bacillus subtilis</i> , <i>Lactobacilloussp.</i> , <i>Escherichia coli</i> , <i>Aspergillus niger</i> , <i>Penicillium chrysogenum</i>	AMS
3. Dentistry clinic, Dentistry labs. Surfaces, walls and sinks and door handles	<i>Sphinomonas paucinobilis</i> , <i>Staphylococcus aureus</i> , <i>Chrysogenum indologinus</i> , <i>E.coli</i> , <i>Penicillium chrysogenum</i> , <i>Sarratia marcescens</i> , <i>Sterptomycus sp.</i>	Dentistry
4. Radiology clinics, Laboratories: surfaces, door handles.	<i>Sphinomonas paucinobilis</i> , <i>Staphylococcus aureus</i> , <i>Sterptomycus sp.</i>	AMs
5. Physiotherapy clinics , door handles	<i>Bacillus subtilis</i> , <i>Staphylocococys hominis</i> , <i>Staphylococcus aureus</i> , <i>Aspergillus niger</i> , <i>Clostridium difficile</i>	AMS

RESULTS AND DISCUSSION

The study extended over six months, where 116 samples were collected from different surfaces area in the medical collages, Najran University new campus Table (1). These areas are including dental collage, applied medical science, pharmacy, nursery and the medicine collage. Among 116 samples there were 31 samples showed microbial growth after incubation on suitable growth media. These objects from the clinics had a heavy microbial burden in comparison with the classrooms and the students closes. Various microbial species were isolated these are gram positive and gram-negative bacteria some fungal species were isolated like Actinomycetes. However, the most common bacterial species were isolated are *Staphylococcus aureus* and *Sphinomonas sp* were the common bacterial species (Table 2). The bed of the patients the dental chairs and the dental lab were heavy in their microbial burden

(Otter, 2013; Donskey, 2013). Despite of routine cleaning of the floors, the surfaces in physiotherapy department have shown heavy microbial contents. It was noticed that cleaning the surface could reduce the microbial burden within for few days. This study highlights the necessity of the routine cleaning procedures aiming to control the microbial loads on the contact surfaces within health care places and hospitals similar study was conducted in south Africa was shoe similar result (Weber, 2013).

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