

Can identification badges be vectors of infection: Experience from a tertiary care center in Riyadh, Saudi Arabia

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ABSTRACT

Background: Wearing identification badges is mandatory in many hospitals. Identification badges worn by healthcare workers may be contaminated with pathogens. **Objective:** The objective of this study is to determine the levels and types of contamination on identification badges of healthcare workers at King Abdulaziz Medical City in Riyadh, Saudi Arabia. **Materials and Methods:** This is a cross-sectional study of 200 healthcare workers at King Abdulaziz Medical City in Riyadh, Saudi Arabia. A data collection form was handed to all the participants and swab cultures of their identification badges were taken. **Results:** A total of 200 identification badges were sampled in this study. 37% were contaminated with pathogens. Coagulase-negative Staphylococcus was isolated from 70 badges (35%), and methicillin-sensitive *Staphylococcus aureus* from four badges (2%). Contamination was highest in physicians (45% compared to 14–32% in other healthcare workers). Males and females had similar contamination rates (39 and 36%, respectively). **Conclusion:** Identification badges worn by healthcare workers may be vectors of significant infection. We suggest more compliance of infection control measures in regards to disinfecting badges or personal belongings of healthcare workers.

Keywords: Colonization, hospital, identification badges, infection, Saudi Arabia transmission

Introduction

It has been established that hospital pathogens can be transmitted by hand from healthcare workers to patients.^[1] This may occur as a result of direct contact with patients or indirectly via an inanimate object.

There have been numerous studies illustrating the bacterial contamination of different personal or nonpersonal items in hospital settings, such as computer keyboards, curtains, cell phones, white coats, and ties.^[2] Similar studies have shown contamination of identification badges and lanyards in a clinical setting.^[3] This contamination can have a potential impact of transmitting hospital-acquired infection (HAI), which is acknowledged as the most frequent adverse event in healthcare and has a high global burden. The effects of healthcare-associated infections imply prolonged hospital stay, long-term disability,

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increased resistance of microorganisms to antimicrobials, massive additional financial burden for health systems, high costs for patients and their family, and unnecessary deaths.^[4]

In 2011, the World Health Organization reported that on average at any given time 7–10% of patients will acquire at least one HAI. In the United States, around 1.7 million patients are affected by HAI each year, representing a prevalence of 4.5% and accounting for 99,000 deaths annually.^[4]

While badges are worn primarily for identification, there has been recent attention to the role of identification badges as vectors of infection. Therefore, we aimed to identify the prevalence of contamination of identification badges among healthcare workers at King Abdulaziz Medical City in Riyadh (KAMC-R).

Materials and Methods

This study was done at KAMC-R, a facility of the Ministry of National Guard. KAMC-R is a tertiary care center which commenced its operations in May 1983. Today KAMC-R has around 10,500 healthcare workers and a bed capacity of around 1000 beds.

A data collection form, which included demographic variables such as gender, age, years of working at KAMC-R, position, and frequency of cleaning the badge, was distributed among the participants before taking their badges and swabbing the front part using sterile cotton swabs dipped in normal saline. The date of expiry of the badge was noted to determine the time the badges have been in use. The samples were cultured in the microbiology lab using the standard procedures to identify the positive bacterial growth. The samples and data collection forms were numbered with the same serial number as in the cotton swab.

Descriptive analysis was preformed using Microsoft Excel and IBM SPSS. The categorical data such as gender, position, department, and frequencies of cleaning the badge were presented as frequencies, and the numerical data such as age and years of working were presented as means and standard deviations. Chi-square was used to compare the gender, department, job position, and frequencies of cleaning with bacterial contamination of the badges. *t*-test was used for years of working at KAMC and age with bacterial contamination of the badges. A *P* value <0.05 is considered to show a significant association.

King Abdullah International Medical Research Center (KAIMRC) approved this study.

Results

A total of 200 identification badges were sampled in this study with a response rate of 50%. General characteristics of subjects were: mean age of the individuals is 38.43 years,

equal number of males compared to females, mean years of working in the hospital of the individuals is 5.37 years, 44.50% of the participants were physicians (9% consultants, 4.5% staff physicians, 22.5% residents, and 8.5% interns), 52% of the participants were nurses, and 3.5% of the participants were technicians. The demographic and clinical characteristics of patients are summarized in Table 1.

Identification badges of 37% of participants were contaminated with pathogens. Coagulase-negative *Staphylococcus* was isolated from 70 badges (35%), and methicillin-sensitive *Staphylococcus aureus* was isolated from four badges (2%). Contamination was highest in physicians (45% compared to 14–32% in other healthcare workers). Males and females had similar contamination rates (39 and 36%, respectively) [Figure 1].

Individuals who had never cleaned their badges (46%) showed to have higher contamination rates compared to individuals who routinely clean their badges (54%). Also, higher rates of contamination were found in medical wards compared to surgical wards and intensive care units.

Discussion

Despite their best intentions, healthcare workers may act as vectors of infections. Identification badges that are worn by healthcare workers usually come into contact with the clinical environment and sometimes directly to the patients. Thus, it is reasonable to expect that they harbor some pathogens which could cause nosocomial infections. The result of our study confirms the presence of substantial contamination in identification badges, mainly with coagulase-negative bacteria.

Table 1: Demographic and clinical characteristics of participants

Characteristics	Participants (n=100)
Age (mean)	38.43
Gender	
Male	100
Female	100
Years of working (mean)	5.37
Roles of participants	
Physicians	89
Nurses	104
Technicians	7

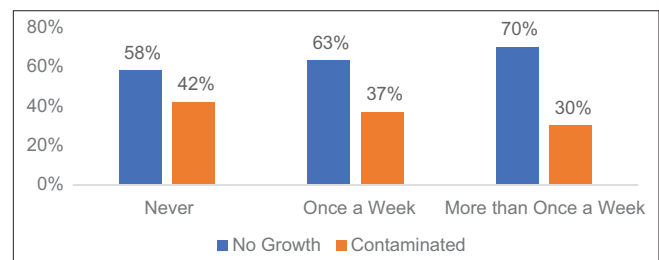


Figure 1: Rates of contaminated identification badges in groups based on frequency of cleaning their badges

The authors found that this study has the largest number of participants compared to earlier studies on healthcare workers belongings.^[3,5-9] Earlier studies showed contamination in 12.5 and 25.3% of identification badges but these findings are confined to smaller numbers of participants (64 and 71, respectively).^[3,8]

Our study showed higher rates of contamination compared to earlier studies, however, the vast majority were coagulase-negative bacteria which is recognized as a low virulent organism and the most common contaminant bacteria in a hospital setting.

In contrast with earlier studies where *S. aureus* and Gram-negative rods were the most commonly found pathogens, our study showed predominance of coagulase-negative bacteria. However, such microbiological finding of high prevalence of coagulase-negative bacteria was found in Shakir *et al.* study on the contamination of cell phones.^[9] It showed an overall rate of 83% pathogenic contamination of cell phones including coagulase-negative Staphylococci.

Our study showed that physicians have higher rates of contamination compared to other groups of participants. An observational study by Pittet *et al.* showed that physicians have lower compliance to hand hygiene compared to nurses.^[10] This could explain the findings of higher levels of contamination of identification badges among physicians.

Although it is not easy to establish the precise role which identification badges might play in transmitting nosocomial infections, our study can be helpful to add on the growing data on healthcare workers' equipment and clothing as potential vectors of infection.

Conclusion

Regular disinfection of identification badges might reduce the levels of contamination, but ultimately, strict compliance of hand hygiene among healthcare workers is the best way to prevent the transmission of infections.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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