Journal of Hospital Infection 102 (2019) 470–474

Available online at www.sciencedirect.com

Journal of Hospital Infection

journal homepage: www.elsevier.com/locate/jhin

Letters to the Editor

Factors affecting bacterial load on nurses' white coats

Sir,

Incidence of infectious diseases is increasing at an alarming rate in India. Proposed strategies for addressing the situation include improvement in reporting and surveillance systems at national level, identification of the local sources of the healthcare-associated infection burden, and for ensuring that hygiene requirements for infection control are in place [1]. White coats of hospital workers have been established as agents for bacterial dissemination [2–4]. However, little is known about the effect of fabric type on microbial adhesion. Microbial adhesion on textiles is a property of surface tension, energy, roughness, and charge as well as hydrophilic/hydrophobic nature. Hence, it is important to study how fabric type affects microbial adhesion.

The current study was undertaken to investigate the contamination of nurses' white coats in a primary

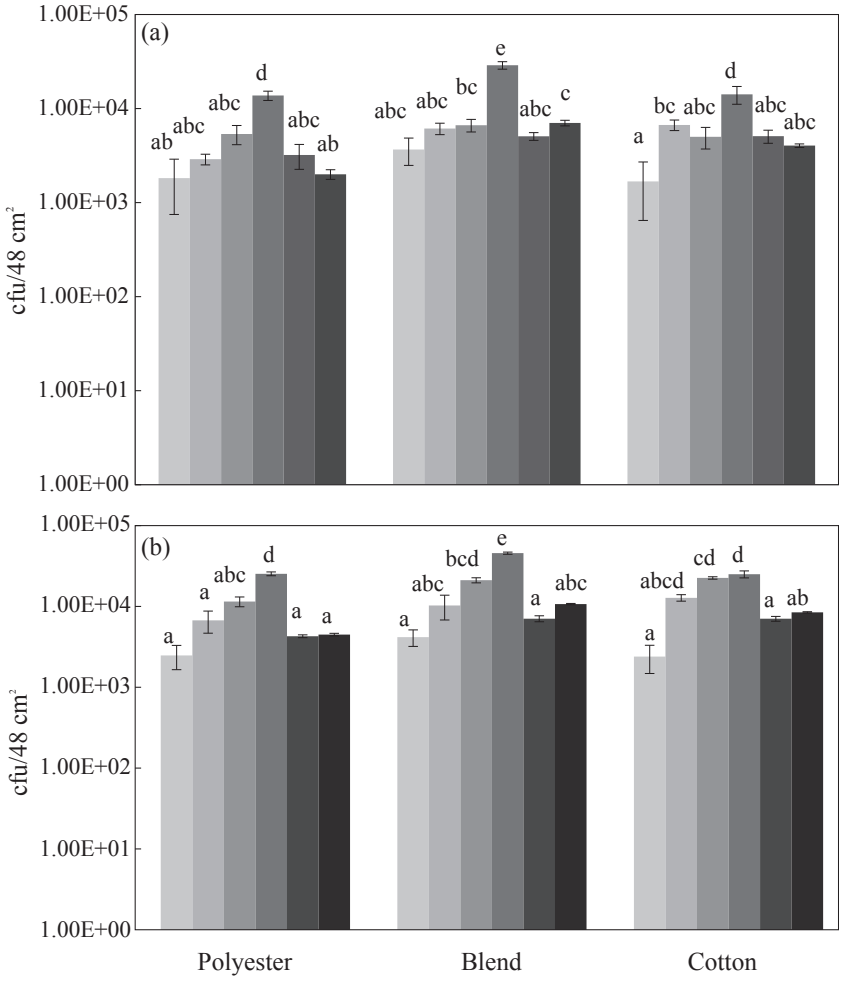

Figure 1. Mean count of bacterial cells detected on three test fabrics after 1st (a) and 3rd (b) shift. Error bars represent standard deviation ($N = 3$). Significantly different values ($P \leq 0.05$) are indicated by lower case letters.

healthcare facility in Delhi. Variables included fabric type (polyester, cotton, and 70:30 polyester:cotton blend), duration of use (one and three shifts), and ambient conditions (March to August). Fabrics were prepared by scouring followed by rinsing, drying, and ironing. Patches of size 6 cm × 10 cm cut from the three fabrics were stitched together to make patches of 18 cm × 10 cm which were wrapped in aluminium foil and autoclaved. Fixing of composite patches on nurses' coat, and sampling for bacterial counts, were performed as per Gupta *et al*. [5,6]. Bacterial contamination was assessed after the first and third shifts (one shift typically of 6 h duration). A total of 58 patches per fabric (total 174 samples) were processed over the study period. Each patch (~48 cm^2) was placed in a sterile Falcon tube with 4.7 mL of phosphate-buffered saline for 5 min and vortexed for 30 s (3000 rpm) to dislodge the bacteria into the solution. A volume of 100 μL appropriately diluted solution was inoculated in Luria Agar. Inoculated plates were dried and incubated for 24 h. SPSS 16.0 for Windows was used to analyse the data. Comparison of mean values was made using Duncan's multiple range test at $P < 0.05$ [7]. One-way analysis of variance was used for comparing different test fabrics.

Maximum bacterial load on all fabrics was detected in the month of June, when ambient temperature (34°C) and relative humidity (49%) were both high. Bacterial abundance on all test samples increased significantly after the third shift (107% on cotton, 83% on polyester, and 67% on blend). This indicates that coats should not be used for more than one shift. Polyester–cotton blend fabric attracted the maximum number of bacteria under all test conditions (Figure 1). We hypothesize that in blend fabric, the cotton component attracts more bacteria because of its hydrophilic nature, and the polyester component holds the bacteria due to hydrophobic–hydrophobic interactions. This creates a synergistic effect leading to increased accumulation of bacteria on the blended fabric. However, this needs further investigations. Bacterial load was not related to the number of patients admitted.

We conclude that bacterial abundance on nurses' coat is related to the type of fabric used, duration of use, and ambient conditions. Effect of fibre composition and fabric characteristics on degree of contamination and retention of microbes needs to be studied further and specific guidelines prescribed by the health ministry for selecting the fabric of white coats.

The total bacterial load considered in the present study may include the nurses' own skin flora as well as environmental flora. Further studies are ongoing to identify the specific bacterial species present on the patches. The three fabrics used in the study had different physical characteristics, which could influence microbial adhesion. Besides, only the emergency ward was sampled in the present study. The microbial load can vary in different wards of the hospital.

Acknowledgements
The investigators thank the hospital administration and nurses of IITD Hospital for participating in this study.

Conflict of interest statement
None declared.

Funding sources
Faculty Interdisciplinary Research Project (MI01681G) and Grand Challenge Scheme (MI1798G), Indian Institute of Technology Delhi to S.S. and D.G. for consumables, and DST-INSPIRE fellowship to S.V.

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Available online 22 February 2019

https://doi.org/10.1016/j.jhin.2019.02.014

Managing seasonal influenza in hospitalized patients – without an influenza point-of-care test

Sir,

We note with interest the impact of the point-of-care tests (POCTs) for diagnosing influenza and other respiratory viruses