Isolation of Bacteria from Hospital Staff Apparel

Orji, MU
Mbata, TI
&
Kalu, OU

Department of Applied Microbiology and Brewing
Nnamdi Azikiwe University
Awka
Nigeria

Abstract
A survey of bacteria contamination of hospital staff apparel in use at Amaku General Hospital, Awka and Nnamdi Azikiwe University Teaching Hospital, Nnewi, all in Anambra State, Nigeria was carried out. A total of 125 samples comprising of 45 samples from protective gowns, 46 samples from hand glove and 34 samples from face-shield were examined. Seventy-two (57.6%) samples comprising 32(44.4%) hand gloves; 28 (38.9%) protective gowns and 12 (16.7%) face-shields showed bacterial contamination. Hand gloves showed more varied bacteria contamination than the other apparels. Some of the epidemiologically important bacteria isolated include; Salmonella spp, Proteus spp, Shigella spp, Klebsiella spp., Bacillus spp, and Staphylococcus aureus. Bacillus spp showed the highest overall isolation frequency of 14.4% while Shigella spp showed the lowest overall isolation frequency of 0.8%

Vue e'ensemble

Resumo
Realizou-se uma pesquisa sobre a contaminação de bactérias no vestuário do pessoal hospitalar em uso no Hospital Geral Amaku, e no Hospital Académico Universitário Nnamdi Azikiwe na Nigéria. Tiraram-se amostras das batas utilizadas em serviço, luvas e máscaras protectoras. Nestas amostras isolou-se uma variedade de bactérias. As implicações os resultados desta pesquisa são aqui discutidas.
Introduction

The modes of spread of transmission of infection is an important attribute of bacteria pathogenicity. Microorganisms are spread in healthcare centers through several routes. Otero, (1996) inferred that the most important and most frequent mode of transmission of nosocomial infections is by contact and that the transmission of infection within any health care facility requires a source of infecting organism, a susceptible host and a means of transmission for the organism. The transmission of infection within health care facilities had been widely reported (Lucas and Mendes 1980; Duguid et al 1980; Garner and Simmons 1983; Beck Sayue 1993 and Arvanitidou et al, 1999). However nosocomial infections continue to pose surprising problems to medical practitioners. There are indications that there is an increase in successful litigations against physicians and hospitals caring for patients with nosocomial infections.

Various types of gowns and other protective apparel are worn to provide barrier protection for the personnel and reduce opportunities for the transmission of epidemiologically important microorganisms in healthcare environments. There are however indications that these apparel could be sources of nosocomia infection. It appears that involvement of these apparel in transmission of hospital infection have not been documented. The objective of this work was therefore to evaluate the bacteria contamination of various hospital staff apparel worn by hospital personnel while attending to patients.

Materials and Method

Sample Collection

A total of 125 samples were collected from hospital staff apparel comprising 45 samples from protective gowns, 46 samples from hand gloves and 34 samples from face- shield. The samples were collected from apparel worn by hospital personnel at the maternity ward, male and female convalescing wards, laboratory units, surgical theaters, dental and pharmacy units of Amaku General Hospital, Awka and Nnamdi Azikiwe University Teaching Hospital, Nnewi, all in Anambra State of Nigeria. The samples were collected between September, 2001 and June, 2002.

Isolation Procedure

Sterile cotton wool swabs wetted by dipping in sterile distilled water were used to collect samples from each of the apparel. The samples so collected were each cultured within two hours of their collection onto plates of nutrient agar (oxide), blood agar and MacConkey agar media by streaking. The plates were incubated at 37°C for 24 hours and the bacteria were isolated in pure cultures and identified using the method described by Kirk et al,(1975), Stiles and Lai-king (1981) and Collee, et al, (1989)

Results

Out of the 125 samples from the hospital staff apparel examined, 72(57.6%) showed bacteria contamination. A break down of the positive samples showed that 32 (44.1%) hand gloves, 28(38.9%) protective gowns and 12(16.7%) face-shields showed bacteria contamination. The types and frequency of isolation of bacteria from the apparel are shown in Table 1.

The result shows that hand groves had more varied bacteria contamination than all the other apparel. Shigella spp, Proteus spp and Salmonella spp were isolated from only hand gloves. Bacillus spp showed the highest isolation frequency (14.4%) followed by Citrobacter spp (10.4%) while Shigella spp showed the lowest over all isolation frequency (0.8%)

Discussion

The result clearly shows that the hospital staff apparel are variously contaminated by bacteria. The presence of Salmonella spp, Proteus spp, Shigella spp and Staphylococcus aureus even though at low frequency is undesirable.
Although the direct involvement of apparel in a case of disease transmission was not investigated in this work, the isolation of these pathogenic bacteria shows that staff apparel is a possible source of nosocomia infection more so as many of the isolates in this work have constantly been implicated in nosocomia infections (Mandell et al., 1985).

Lucas and Mendes (1980) isolated similar organisms in addition to *Streptococcus faecalis*, *Micrococcus spp* and *Alkaligenes faealis* from sanitary dressings. *Pseudomonas aeruginosa* although not isolated in this study was reported by Brooks et al. (1998) to have been isolated from apparel.

Majority of the organisms were isolated from apparel used in the Amaku General Hospital, Awka. This may be a result of the constant use and re-use of the same apparel on patients resulting in their contamination with patient's flora. The result of this work also suggests that there is poor hygienic practices in some of our hospitals and the apparel are not adequately cared for.

### References


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Box 24309, Sandowne, 7779
Tel: +27 (0)21 797-5101
Fax: +27 (0)21 762-7424
E-mail: academic@juta.co.za
Website: www.juta.co.za

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