ORIGINAL RESEARCH PAPER
Volume-9 | Issue-1 | January-2020 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

HAND HYGIENE STUDY IN HOSPITAL PERSONNEL IN THE SAME SETTINGS: RANDOMIZED CONTROLLED TRIAL

Microbiology

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ABSTRACT

Background: Hand hygiene is seen as one of the principal means of preventing hospital-acquired infections for both health care workers and patients. Healthcare-associated infections (HCAIs) are worldwide primarily due to poor hand hygiene practices. Hand antisepsis reduces the prevalence of health-care-associated infections. The hands of hospital settings workers are the most common vehicle for the transmission of micro-organisms from patient-to-patient and within the healthcare environment. Healthcare-associated infections are drawing increasing attention from patients, insurers, governments, and regulatory bodies. This is not only because of the magnitude of the problem in terms of the associated morbidity, mortality and low rate of treatment but also due to the growing recognition that most of these are preventable.

Aim of the study: The aim of our study was to analyze the hand hygiene among HCWs both right and left hand.

Methods: The study was carried out in the Medical and Surgical ICUs of a tertiary care NIMS multispecialty and super specialty hospital, Jaipur, Rajasthan. Considering the resources available, we decided to randomly select 129 samples from each hand of 43 healthcare workers (both male and female). All the samples were collected during early hours (i.e., before entering ICUs). Processing was carried out by taking the swab samples with peptone water from each HCW and incubated for 18-24 hours at 37℃ and sub cultured on blood and MacConkey agar and again incubated the culture plates for 18-24 hours at 37℃, Gram staining and biochemical identifications were done.

Result: The percentage of various isolates in right hand were GPB (67.44%), *E. coli* (1.55%), *Pseudomonas spp.* (0.78%), *Klebsiella spp.* (0.78%) and No growth (29.45%) and in left hand GPB (65.12%), *E. coli* (3.10%), *Pseudomonas spp.* (1.55%), *Klebsiella spp.* (1.55%) and No growth (28.68%).

Conclusion: In conclusion, hand hygiene among healthcare workers and patients is a key issue with in a healthcare setting to prevent healthcare-associated infections.

KEYWORDS

Hand hygiene (HH), Healthcare workers (HCWs) Healthcare-associated infections (HCAIs), Intensive care units (ICUs), Nosocomial infections (NIs).

INTRODUCTION:

Hand hygiene remains one of the most important actions in preventing infections in healthcare settings and preventing hospital-associated infections that affect hundreds of millions of individuals worldwide per year leading to significant illnesses, disabilities, prolonged hospital stays and added financial burden to patients, families and the healthcare system (1, 2).

In 1938, bacteria recovered from the hands were divided into two categories: transient and resident flora (3). The transient flora, which colonized the superficial layers of the skin are more compliant to remove by routinely used hand wash. They are often acquired by Health care workers during direct contact with patients or contact with contaminated environmental surfaces within the togetherness of the patient. Resident flora which are attached to inner layers of the skin, are more resistant to removal. The included resident flora e.g., Coagulase-negative staphylococci (CONS) and diphtheroid are unlikely to be associated with such hospital setting infections. The hands of Health care workers may become continuously colonized with pathogenic flora e.g., some gram-positive cocci, gram-negative bacilli, or yeast. Investigators have acknowledged that, although the number of transient and resident flora varies considerably from person to person, it is often relatively constant for any specific person [3,4].

Pathogenic microorganisms can stay for 2-60 minutes on healthcare worker's hands, there is no accepted evidence that strict adherence to hand hygiene reduces the risk of cross-transmission of infections through the handshake. With "Clean Care is Safer Care" as a prime agenda of the global initiative of "WHO" on patient safety programs, it is time for developing countries to formulate the much-needed policies for implementation of basic infection prevention practices in health care-associated setups [5]. In intensive care units (ICU), the number of direct contacts between the hands of the health care workers and the patients is particularly high, leading to a higher risk of health problems [6].

Trials have studied the effects of hand washing with plain soap and water versus some form of hand antisepsis on healthcare-associated infection rates [7, 8]. Health-care–associated infection rates were lower when antiseptic hand washing was performed by personnel [7]. In another study, antiseptic hand washing was associated with lower health-care-associated infection rates in certain intensive-care units, but not in others [8].

Some investigators have studied the transmission of infectious agents by using different experimental models. During the working hours, nurses were asked to touch the nearby genital part of patients are mostly found it gram-positive cocci and gram-negative bacilli for 10-15 seconds as though they were taking a femoral pulse and artery [9]. Any health care workers then cleaned their hands by washing with plain soap and water or by using an alcohol hand rinse. After cleaning their hands, they touched without the precaution of urinary catheter material with their fingers, and the catheter segment was cultured. The touching intact areas of moist skin of the patient transferred enough organisms to the nurses and health care workers' hands to result in subsequent transmission to catheter-associated infection, and clean hand washing with plain soap and water and used antiseptic

AIMS AND OBJECTIVES:

The aim of our study was to analyze the hand hygiene among HCWs both right and left hand.

MATERIALS AND METHODS:

The study was carried out in the Medical ICUs, Surgical ICUs and OTs of a tertiary care NIMS multi specialty and super specialty hospital, Jaipur, Rajasthan. Considering the resources available, we decided to randomly select 129 samples from each hand of 43 healthcare workers

(both male and female).

Research design:

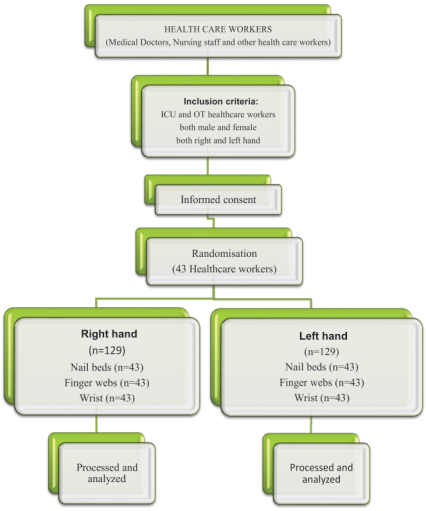
Inclusion criteria:

- ICU and OT Healthcare workers
- Both female and male
- Both right and left hand

Exclusion criteria:

- Wards
- Laboratories

All the samples were collected during early hours (i.e., before entering ICUs and OT). Processing was carried out by taking the swab samples with peptone water from each HCW and incubated for 18-24 hours at 37℃ and sub cultured on blood and MacConkey agar and again incubated the culture plates for 18-24 hours at 37℃, Gram staining and biochemical identifications were done.



Flow chart of the research design

RESULT:

The percentage of various isolates in right hand (shown in Fig.1) were GPB (67.44%), *E. coli* (1.55%), *Pseudomonas spp.* (0.78%), *Klebsiella spp.* (0.78%) and No growth (29.45%) and in left hand (shown in Fig. 2) GPB (65.12%), *E. coli* (3.10%), *Pseudomonas spp* (1.55%), *Klebsiella spp* (1.55%) and No growth (28.68%).

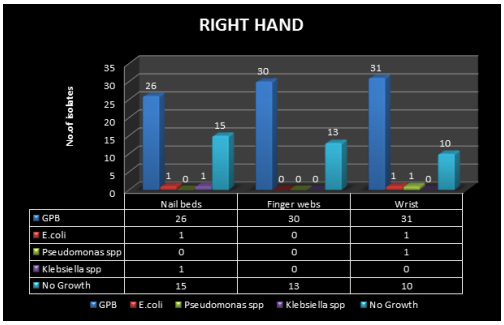


Fig.1: Graph showing no. of isolates in Right hand

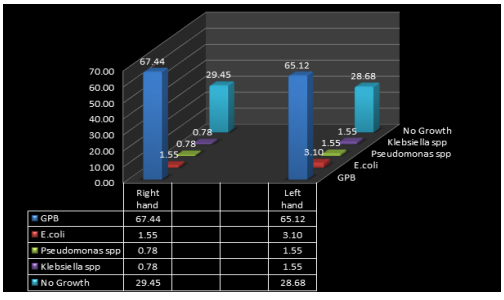


Fig. 3: Graph showing aggregated percentage (%) of Isolates in both left and right hand

DISCUSSION:

In our study, we found out most predominant organisms were normal skin commensals. In right hand GPB (67.44%), *E.coli* (1.55%), *Pseudomonas spp* (0.78%), *Klebsiella spp* (0.78%) and No growth (29.45%). In left hand GPB (65.12%), *E.coli* (3.10%), *Pseudomonas spp* (1.55%), *Klebsiella spp* (1.55%) and No growth (28.68%). Our study is similar to Banfield and Kerr, who discussed patient hand hygiene as a significant 'missing link' in prevention and transmission of healthcare-associated infections [(10)].

Our study found that resident flora in right hand (67.44%) and (65.12%) in left hand, our study is similar to this study, the use of hand antiseptic agents significantly reduces the rate of transient flora has been a matter of debate (Girou et al., 2002) [(11)]. Their findings suggest that a number of factors contributing to patient hand hygiene compliance were influenced by knowledge, attitudes, and accessibility of facilities. It is noteworthy that, in our study, hand samples were obtained during routine patient care under non-standardized conditions. Our results may shed light on the contaminating flora on HCWs hands just before contact with patients, reproducing real-life daily practice. Bacterial contamination of the hands of hospital staff is a vital process that results from multiple factors probably related to the kind of patient care (Pittet et al., 1999) [(12)].

Health-care administrators should take responsibility to provide HCWs with access to a safe, continuous water supply at all outlets and access to the necessary facilities to perform hand washing, a readily accessible alcohol-based hand rub at the point of patient care, ensure that HCWs have dedicated time for infection control training, including sessions on hand hygiene, information regarding hand-care practices designed to reduce the risk of irritant contact dermatitis and other skin damage in education programs for HCWs, provide alternative hand hygiene products for HCWs with confirmed allergies or adverse reactions to standard products used in the health-care setting and provide HCWs with hand lotions or creams to minimize the occurrence of irritant contact dermatitis associated with hand antisepsis or hand washing.

CONCLUSION:

In order to make health care setting safe for patient health which is otherwise compromised due to the risk of health care-associated infections because of less attention paid by health care workers for hand hygiene practice. Consistency of aseptic hand hygiene should be the key concern for all the HCWs for effective prevention of nosocomial and HCAIs. Hand hygiene is the first line preventive measure proven to be effective in HCAI and the spread of antimicrobial resistance. HCWs can also become infected at the time of patient handling. Most oftenly, HCWs encounter with certain difficulties in managing the hand hygiene use at various levels.

The Hand hygiene education should be prioritized. Medical students educational curriculum should provide clear evidence that hands of the HCWs are prone to get infected upon touching patients, objects and articles. Alcohol based hand rubs are the simple, effortless and utmost effective means to antiseptize hands in order to minimize the rates of HAIs. HCWs must brace themselves to inseminate the simple, effortless and greater effective practice of hand hygiene in their day-to-day patient care exercise and serve as an exemplar for the upcoming generations of doctors, nurses and paramedical personnel's.

Acknowledgements:

The authors will be thankful to all participating healthcare workers.

REFERENCES:

1. World Health Organization. Evidence of hand hygiene to reduce transmission and infections by multidrug resistant organisms in health-care settings. World Health Organization 2009.
2. Burnett E. Perceptions, attitudes, and behavior towards patient hand hygiene. Am J Infect Control 2009; 37(8): 638-642. https://doi.org/10.1016/j.ajic.2009.04.281
3. Price PB. Bacteriology of normal skin: a new quantitative test applied to a study of the bacterial flora and the disinfectant action of mechanical cleansing. J Infect Dis 1938;63:301–18.
4. Sprunt K, Redman W, Leidy G. Antibacterial effectiveness of routine hand washing. Pediatrics 1973;52:264–71.
5. J. L.Anderson, C. A.Warren, E. Perez et al., "Gender and ethnic differences in hand hygiene practices among college students," American Journal of Infection Control, vol. 36,no. 5,pp. 361–368, 2008.
6. Fridkin, S. K., and R. P. Gaynes. 1999. Antimicrobial resistance in intensive care units. Clin. Chest Med. 20:303–316.
7. Maki DG. The use of antiseptics for handwashing by medical personnel. J Chemother 1989;1(suppl 1):3–11.
8. Massanari RM, Hierholzer WJ Jr. A crossover comparison of antiseptic soaps on nosocomial infection rates in intensive care units. Am J Infect Control 1984;12:247–8.

9. Ehrenkranz NJ, Alfonso BC. Failure of bland soap handwash to prevent hand transfer of patient bacteria to urethral catheters. Infect Control Hosp Epidemiol 1991;12:654–62.
10. Banfield K, Kerr K. J Hospital Infection 2005;61(3):183-188
11. Girou, E., Loyeau, S., Legrand, P., Oppein, F. & Brun-Buisson, C.(2002). Efficacy of handrubbing with alcohol based solution versus standard handwashing with antiseptic soap:randomised clinical trial.BMJ 325, 362.
12. Pittet, D., Dharan, S., Touveneau, S., Sauvan, V. & Perneger, T. V.(1999).Bacterial contamination of the hands of hospital staff during routine patient care. Arch Intern Med 159, 821–826.