

## Short Communication

DOI: <https://dx.doi.org/10.18203/2394-6040.ijcmph20214615>

# Contamination of 'in-use' bar soaps in dental clinics of University hospital

Jyoti Sharma\*, Manjula Mehta, Sonia Bhonchal Bhardwaj

Department of Microbiology, Dr. Harvansh Singh Judge Institute of Dental Sciences and Hospital, Panjab University, Chandigarh, India

**Received:** 22 September 2021

**Revised:** 31 October 2021

**Accepted:** 15 November 2021

**\*Correspondence:**

Dr. Jyoti Sharma,

E-mail: contactjyotisharma@yahoo.co.in

**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

## ABSTRACT

Hand carriage of bacteria is an important route of transmission of infection in health care settings. Hand washing continues to be the most effective mechanism of prevention of the spread of infection in hospitals. In this study the 'in-use' bar soaps in the dental hospital were sampled to look for the presence of microorganisms on their surfaces. All the soaps which were sampled yielded the growth of microorganisms on them. The isolated microorganisms are Bacillus, Micrococci, Staphylococci and gram-negative bacilli. Since the use of 'in-use' bar soaps function as reservoir of microorganisms so contact free soap dispensers, soap strips or liquid soap should be used in hospital settings to prevent the transmission of microorganisms.

**Keywords:** In use soap, Contamination, Microorganism

## INTRODUCTION

Hands play an important role in carriage and transmission of microbes from patients to health care workers or between patients.<sup>1,2</sup> Risk of infection in dental operatory has always been a high-priority zone.<sup>3</sup> The dental professionals and patients are exposed to pathogens transported by aerosols and droplets, which are being produced during various dental procedures,<sup>4</sup> leading to health care associated infections.<sup>5,6</sup> So, hand hygiene has been considered to be most effective measure in reducing the transmission of microbes. The microbial flora of hands consists of two types of microorganisms, the resident and the transient. The resident flora survive on the skin and multiply there only, whereas transient organisms are the contaminants acquired from the infected patients or contaminated surfaces in the hospital environment and these transient microbes are frequently held responsible for carrying health care associated infections. Since ages soap has been widely used as an adjunct for hand washing. It has been observed that the bar soaps have been routinely

used for hand washing by the dental professionals in their clinics, since hand washing with plain soap is effective in removing most transient microorganisms.<sup>7</sup> The reports from some studies has shown the presence of microorganisms on 'in-use' bar soaps.<sup>8,9</sup> The aim of the study was to determine the bacterial contamination of 'in-use' bar soaps in our dental hospital.

## METHODS

### Setting

The study was carried out in the department of microbiology at Dr. Harvansh Singh Judge Institute of Dental Sciences and Hospital, Panjab University, Chandigarh.

A total of 15 samples were collected from the surfaces of bar soaps placed at the sinks of toilets and at the working station of the clinics. The samples were collected with the sterile aseptic technique. Swabs were taken from the wet

surface of the bar soaps. For sample collection the swab was slid in a single stroke over the top surface of the soap and was immediately placed back into the test tube containing normal saline and was sent for microbiological analysis.

### Microbiological analysis

The sample tubes were vortexed and then the samples were inoculated on blood agar, mac conkey agar plates and SDA and incubated at 37°C for 24-48 hrs. All the isolates were identified on the basis of gram-stain, colony morphology and conventional biochemical testing.

### RESULTS

Among the 15 soaps sampled to check contamination, all the soaps showed the presence of microbes. All the samples recorded polymicrobial growth. Table 1 summarises different isolates present on the soaps and their frequency isolation. The bar soap harboured both pathogenic and non-pathogenic bacteria. *Micrococci*, *Bacillus*, *S. epidermidis*, *S. aureus*, gram negative *bacilli* and *Aspergillus* were isolated from these soap samples.

**Table 1: Frequency of isolation (%) of various microorganisms from soap bars.**

Organisms	Frequency of isolation (%)
<b>Bacillus</b>	93.3
<b>Micrococci</b>	93.3
<b>S. aureus</b>	13.3
<b>S. epidermidis</b>	60
<b>Gram negatibe bacillus</b>	20
<b>Aspergillus</b>	20

### DISCUSSION

The aim of the study was to evaluate the microbial flora of in-use bar soaps. The results showed that the entire bar soaps in in-use condition yielded growth of microorganisms. Our finding are in concordance with other studies.<sup>10,11</sup> These bar soaps are in direct contact with the bacteria on skin, and these bacteria have ability to survive on the bar soap surfaces which are continually in use. These in-use soaps are continually being re-inoculated by bacteria from hands. The viability of the microorganism is protected because of the organic matter present.<sup>12</sup> Additionally these soaps are placed in open soap cases which are mostly neglected and not washed regularly. Hence, they serve as depot of microorganisms. The role of in-use bar soaps in the outbreak of infection in the hospitals has been well documented.<sup>13</sup> Yet another study by Bannan et al reported that the organisms were continually being removed either mechanically or due to self-sterilizing activity of the soap.<sup>14</sup>

### CONCLUSION

Though the hypothesis of transferring microorganisms to the hands of health care workers via contaminated soap bars have not confirmed. The Centre for Disease Control and Prevention has suggested that bar soaps should not be used for hand washing in hospital settings. So, the alternative means of hand washing like liquid soaps, soap strips, surgical scrubs, contact free soap dispenser or foot operated soap dispenser should be encouraged.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

### REFERENCES

1. Gruendemann BJ, Larson EL. Antiseptis in current practice. In: Rutala WA, eds. Disinfection, sterilization and antiseptis in health care. Washington, DC: Association for Professionals in Infection Control and Epidemiology; 1998: 183-195.
2. Boyce JM, Pittet D, Healthcare Infection Control Practices Advisory Committee, HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. Guideline for Hand Hygiene in Health-Care Settings. Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. Society for Healthcare Epidemiology of America/Association for Professionals in Infection Control/Infectious Diseases Society of America. MMWR Recomm Rep. 2002;51:1-45.
3. Györfi A, Fazekas Significance of infection control in dentistry: a review. Fogorv Sz. 2007;100(4):141-52.
4. Harrel SK, Molinari J. Aerosols and splatter in dentistry: a brief review of the literature and infection control implications. J Am Dent Assoc. 2004;135(4):429-37.
5. Castiglia P, Liguori G, Montagna MT, Napoli C, Pasquarella C, Bergomi M, et al. Italian multicenter study on infection hazards during dental practice: control of environmental microbial contamination in public dental surgeries. BMC Public Health. 2008;8:187.
6. Szymańska J. Dental bioaerosol as an occupational hazard in a dentist's workplace. Ann Agric Environ Med. 2007;14(2):203-7.
7. Bettin K, Clabots C, Mathie P, Willard K, Gerding DN. Effectiveness of liquid soap vs. chlorhexidine gluconate for the removal of *Clostridium difficile* from bare hands and gloved hands. Infect Control Hosp Epidemiol. 1994;15(11):697-702.
8. Kabara JJ, Brady MB. Contamination of bar soaps under "in-use" conditions. J Environ Pathol Toxicol Oncol. 1984;5(4-5):1-14.
9. Brook SJ, Brook I. Contamination of bar soaps in a household setting. Microbios. 1993;76(306):55-7.

10. Balows A. Manual of clinical microbiology. In: Murray PR, Baron JH, Jorgenson MA, eds. 8th ed. Washington: ASM Press; 2003: 422-433.
11. McBride ME. Microbial flora of in-use soap products. *Appl Environ Microbiol.* 1984;48(2):338-41.
12. Ulrich JA. Antimicrobial efficacy in the presence of organic matter. In: Maibach H, eds. Skin microbiology: relevance to clinical infection. New York, NY: Springer Verlag; 1981: 149-157.
13. Jacques L, Mathieu D, Baumann F, Roussel A. Bacteriological study of hands and the use of soap in the hospital environment. *Biomed Pharmacother.* 1983;37(9):415-8.
14. Bannan EA, Judge LF. Bacteriological studies relating to handwashing. 1. the inability of soap bars to transmit bacteria. *Am J Public Health Nations Health.* 1965;55(6):915-22.

**Cite this article as:** Sharma J, Mehta M, Bhardwaj SB. Contamination of 'in-use' bar soaps in dental clinics of University hospital. *Int J Community Med Public Health* 2021;8:6061-3.