Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

EVIDENCE FOR PRACTICE

Bacteria bound to cloth; glucoprotamin; toluidine blue 0; surgical helmets versus filtering masks

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This information is intended for general use only. The clinical implications are specific to the abstracted article only. Individuals intending to put these findings into practice are strongly encouraged to review the original article to determine its applicability to their setting.

Cloth as a transmitter of infectious agents

American Journal of Infection Control
February 2004

Protecting patients from health care-associated infections is a multifaceted process rooted in the concept that these infections may be caused by pathogens from other patients or hospital personnel. Although health care workers' hands are the primary mechanism of transmission, their clothing also easily can become contaminated and serve as a source of infection transmission. The purpose of this study was to analyze the bacteria-binding properties of different cloth materials.[1]

Cloth fibers (ie, cotton, nylon, polyester, acrylic, wool) were incubated with bacterial suspensions of standard and clinically isolated strains of *Staphylococcus aureus* and *Pseudomonas aeruginosa* in silicone-coated tubes. Colony-forming units (CFUs) were determined, and the binding ratios were calculated. Statistical methods, including means and standard deviations, were used to analyze the data and compare observed differences.

Findings. *Staphylococcus aureus* strains bound to acrylic, polyester, and wool fibers at very high levels (ie, on average, 87.6%, 96.2%, and 63.2%, respectively). *Pseudomonas aeruginosa* strains also bound to acrylic, polyester, and wool at high levels (ie, on average, 95.4%, 99.9%, and 84.7%, respectively). *Staphylococcus aureus* bound to cotton and nylon fibers at very low levels (ie, 2% and 0.9%, respectively), and *Pseudomonas aeruginosa* strains bound to cotton and nylon fibers at 15% and 8%, respectively.

Clinical implications. The results of this study suggest that polyester, acrylic, and wool clothing can be good carriers of *Staphylococcus aureus* and *Pseudomonas aeruginosa* strains, two major pathogens commonly involved in health care-associated infections. Perioperative nurses and managers should consider these findings when evaluating scrubs or warm-up jackets to be used in perioperative settings.

Performance of glucoprotamin as a high-level disinfectant

Infection Control and Hospital Epidemiology
October 2003

Endoscopes and other heat-labile, semicritical instruments must undergo high-level disinfection or sterilization before reuse. Glucoprotamin is a new disinfecting agent licensed in Europe as a high-level disinfectant for instruments. The purpose of this prospective, observational study was to determine the efficacy of glucoprotamin under clinical conditions, such as reprocessing used instruments in a hospital setting.[2]

Used specula and forceps were collected during 10 consecutive days and sent to a laboratory within four hours of having been used. Without their having been washed or brushed, the instruments were immersed in saline solution. A 1.5% concentration of glucoprotamin was added, and the instruments were soaked for 60 minutes. Biocidal activity was assessed by determining the difference in CFU on instruments before and after disinfection.

Findings. One hundred thirty-seven instruments (ie, 73 specula, 64 forceps) were studied. Before processing with glucoprotamin, the average bioburden per instrument was between 10^5 CFU

and 10^7 CFU. After processing, no vegetative bacteria were isolated in any sample. Bacterial killing was more than 5 $\log_{10}$ CFU (range 5.01 to 7.17).

Clinical implications. This clinical study showed that glucoprotamin was effective as a high-level disinfectant for reprocessing instruments. Bacterial killing in excess of 5 $\log_{10}$ CFU was observed after one hour even though the instruments did not undergo a cleaning process before they were submerged in the disinfectant. This product must be registered and approved by the Environmental Protection Agency before it can be marketed in the United States as a product for high-level disinfection. If this product is approved, it will represent an additional choice for perioperative nurses for reprocessing instruments and supplies that require high-level disinfection.

Light-induced killing of bacteria

Infection Control and Hospital Epidemiology
October 2003

Instruments, equipment, and surfaces can harbor microorganisms and serve as a source of infecting pathogens for both patients and health care personnel. Keeping the environment in the perioperative setting as clean as possible through routine damp dusting and cleaning with a hospital-grade disinfectant is a daunting task, and the level of success depends on the skill and diligence of the support personnel assigned to this task. The purpose of this study was to determine whether light-induced killing of bacteria could be achieved when a photosensitizer was incorporated into material that could be used to coat a surface.[3]

The bottom surfaces of glass containers were coated with a cellulose acetate layer containing the photosensitizer toluidine blue O. Cellulose acetate coatings without toluidine blue O were used as controls. Suspensions of a strain of methicillin-resistant *Staphylococcus aureus* (MRSA), a gram-positive pathogen, and a clinical isolate of *Pseudomonas aeruginosa*, a gram-negative pathogen, were transferred to the containers and exposed to light (ie, a 60-watt domestic light bulb) for eight, 16, or 24 hours. The light intensity at the surface of the coating was measured at the start, in the middle, and at the end of each exposure period, and the effect of light on bacterial viability was determined. The Mann-Whitney U test was used to determine whether differences in the bacterial counts were significant.

Findings. The light intensity at the surface of the coating was 778 ± 12 lux. Toluidine blue O has considerable absorbancy over the range of 550 nm to 670 nm, and therefore, it was able to capture a large proportion of the radiant energy. Significant killing of MRSA exposed to the cellulose acetate layer containing toluidine blue O was observed at eight hours (65% [P = .033]), 16 hours (79% [P = .003]), and 24 hours (94% [P = .001]). Similarly, significant killing of *Pseudomonas aeruginosa* of 70% (P = .001) at eight hours, 94% (P = .001) at 16 hours, and 99.9% (P = .001) at 24 hours was observed.

Clinical implications. This study demonstrates that two groups of important health care-associated pathogens can be killed by the light-activated antimicrobial agent toluidine O incorporated into a polymer. This coating promises to be particularly useful in perioperative settings.

Surgical helmets compared to filtering masks

Emerging Infectious Diseases
February 2004

Severe acute respiratory syndrome (SARS) is a newly emerged, highly contagious condition. This illness can be transmitted to health care workers who do not use adequate respiratory isolation precautions and contact isolation procedures when caring for infected patients.

Surgical helmets are devices that cover the entire head and are intended to decrease the possibility of contamination of surgical wounds and protect personnel from

splashes of bloodborne pathogens. The purpose of this prospective, unblinded study was to determine whether surgical helmets are effective in preventing respiratory transmission of SARS.[4]

The filtration capacity of two different types of surgical helmets were compared with a filtering face-piece mask combined with a surgical mask and full-face shield. Six participants performed a series of maneuvers using each device. The maneuvers included normal breathing, deep breathing, turning the head from side to side, flexing and extending the head, talking loudly, and bending over, followed by normal breathing. Particle counts inside and outside the protective devices were performed during the series of activities. The median ratios of ambient to device particle counts were compared using Mann-Whitney U tests.

Findings. The ratios for the two surgical helmets were significantly lower in all tests compared to the combination of a filtering mask with a surgical mask and face shield ($P < .004$). In all the tests, the filtering face mask filtered significantly more particles than either of the surgical helmets. The filtering mask reduced particle counts by a factor of 100, while the surgical helmets reduced the particle count by a factor of 4.8.

Clinical implications. This study revealed that two types of surgical helmets had markedly inferior in vivo filtration performance compared to the combination of a filtering mask, surgical mask, and face shield. Neither of the surgical helmets meets the current performance requirement for health care respirators. Perioperative nurses should be prepared to care for patients with SARS and should understand that surgical helmets do not offer adequate protection against transmission of this disease. ❖

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NOTES

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2. A E Widmer, R Frei, "Antimicrobial activity of glucoprotamin: A clinical study of a new disinfectant for instruments," *Infection Control and Hospital Epidemiology* 24 (October 2003) 762-764
3. M Wilson, "Light-activated antimicrobial coating for continuous disinfection of surfaces," *Infection Control and Hospital Epidemiology* 24 (October 2003) 782-784.
4. J L Derrick, C D Gomersall, "Surgical helmets and SARS infection," *Emerging Infectious Diseases* 10 (February 2004) 277-279.

Women with Overactive Bladder Are Less Sexually Active

Women who experience overactive bladder and express a high degree of bother as a result of urge urinary incontinence are less likely to enjoy sexual activity and are less sexually active, according to a May 9, 2004, news release from the University of Pittsburgh Medical Center, Pittsburgh. The study of 78 women diagnosed with overactive bladder also found that participants who experienced a significant amount of genital or abdominal pain were less likely to enjoy sexual activity.

Study participants completed a questionnaire that evaluated the presence and degree of bother caused by symptoms of overactive bladder and another questionnaire that evaluated their sexual function. Researchers compared the answers on both questionnaires to reach their conclusions.

Overactive bladder is a condition in which the muscle surrounding the bladder contracts spastically causing frequent urination or incontinence. It affects more than 17 million Americans, half of whom are women. An estimated 80% of these patients do not seek help or treatment, possibly because there is still a stigma about talking to a physician about overactive bladder, according to the release.

Symptoms of Overactive Bladder Affect Sexual Activity of Women *(news release, San Francisco: University of Pittsburgh Medical Center, May 9, 2004)*. http://newsbureau.upmc.com/Medsurg3/AUA2004FemDys.htm *(accessed 26 May 2004)*.