Colonization of Yankauer Suction Catheters with Pathogenic Organisms

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Introduction: Transmission of pathogenic organisms (viruses, bacteria, and fungi) within hospital units has been shown to play a major role in the development of serious nosocomial infections. The rising incidence of antibiotic-resistant bacteria has amplified the risk to patients and staff. Health care workers are at risk of becoming contaminated with such pathogens and transferring them to patients and other health care workers they encounter. Such person-to-person transfer may be facilitated by contaminated fomites in the environment. For example, studies have shown a high incidence of contamination of physicians' stethoscope diaphragms and neckties with pathogens. We studied the incidence of contamination of Yankauer suction catheters obtained from the bedside of patients in 3 intensive care units (ICUs).

Methods: A convenience sample of Yankauer catheters present at the bedside of critically ill patients in any of 3 ICUs were collected, after at least 24 h of use. Each subject catheter came from a different patient. The catheter tips were immediately submerged in culture broth and agitated for 10-15 sec. The resulting solution was then centrifuged and plated on agar plates and analyzed using standard culture techniques for pathogens. Results of cultures are presented as a percentage of total Yankauers submitted.

Results: 20 Yankauer catheters from three ICUs were collected and cultured over the course of three months. Ten catheters were collected in the surgical IOU, and 5 each in the medical and cardiac ICUs. Nine (45%) of the collected catheters were found lying on top of medical equipment, in a patient's bed, or on the floor.

Sixteen (80%) of the catheters yielded cultures for one or multiple pathogens. Seven (35%) of catheters were colonized with multiple pathogens. Mixed oropharyngeal flora were cultured from each of the remaining catheters. Organisms encountered included *Staphylococcus aureus* (25%) of which 60% were methicillin-resistant. Enteric gram-negative rods, including *Pseudomonas aeruginosa* and *Eschericia coil* were seen, as were Viridans *Streptococci,* coagulase-negative *Staphyloccci, Enterococcus* species (1 of 3 isolates vancomycin-resistant), and *Candida* species. See Table I for frequencies of pathogens. Semiquantitative estimation of plate growth showed "moderate" or "abundant" growth of organisms from 15 (75%) of catheters, and for 20 of 25 (80%) of pathogens.

Table 1. Frequencies of pathogenic organisms cultured from 20 individual Yankauer catheters.

Organism Cultured	***n***	***%***
Candida species	6	30
Enteric gram-negative rods	5	25
Coagulase-negative *Staphylococcus*	*4*	20
MRSA	3	15
Methicillin-sensitive *Staphylococcus*	2	10
Viridans *Streptococci*	2	10
Enterococci vancomycin-sensitive	2	10
VRE	1	5

M RSA = methicillin-resistant *Staphylococcus aureus;* VRE = vancomycin-resistant *Enterococcus*

Conclusions: There is a very high incidence of contamination of Yankauer catheters with highly pathogenic bacteria and fungi. This is not surprising given their use in suctioning the oropharynx, nasal drainage, and other draining sites, all frequently colonized with pathogens. A significant concern is that, given the usual treatment of such catheters (lying in the bed sheets, on the floor, on ventilator surfaces, etc), that gross contamination of the care environment can occur. Furthermore, health care workers such as nurses and therapists who utilize the catheter may themselves become colonized and transmit infection. These and all such suction catheters should only be handled with gloved hands, adequate hand washing must be practiced before and after use, and appropriate receptacles to contain and isolate the Yankauer suction catheter are mandatory. The commonly observed practice of placing uncovered Yankauers on beds, medical equipment, or other hospital surfaces is below the standard of care and must no longer be tolerated.