Study Of Bacterial Colonization Of Mobile Phones And Writing Pens In Tertiary Care Hospital

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Abstracts: Background and Aim**:** Health care workers accessories like mobile and pen have become important fomites in spread of health care infections and when used at the patient's point of care may be responsible for cross contamination. Aim is to determine whether mobile phones and pens could play a role in the spread of bacterial pathogens. Methodology**:** Swabs from from mobile phones and pens were taken and inoculated on blood agar and MacConkey agar plates and the isolates were identified by standard microbiological procedures. Results: 28 /74(37.83%) mobile phone and 22/74(29.73%) pens showed bacterial contamination. *Coagulase negative staphylococcus* accounted for the majority of positive isolates. Conclusion**:** Mobiles and pens are potential reservoir for bacteria. They might be a vector in the transmission of potential pathogenic microorganisms. The risk can be reduced by using alcohol-based sanitizing agents for wiping mobile and pen. [Deshkar S NJIRM 2016; 7(3):80 - 82]

Key Words: Bacterial contamination, mobile phones, pens.

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Introduction: Health care workers [HCW] accessories like stethoscope, mobile and pen have become important fomites in spread of health care infections.[1] Personal equipments like mobiles and pens used at the patient's point of care may be responsible for cross contamination and these represent an important risk for hospitalized patients. To further increase this complexity, mobiles of health care workers showed 9-25% contamination with pathogenic bacteria, *Staphylococcus aureus* and *Acinetobacter* species being the most common.[2] Therefore, the present study was conducted to determine whether mobile phones and pens could play a role in the spread of bacterial pathogens and to proffer possible control or preventive measures that could be instituted to avoid this likely vehicle of infection.

Material and Methods: The study was conducted in department of Microbiology, Indira Gandhi Government Medical College and Hospital, Nagpur from July - September 2015. Approval was obtained from Institutional Ethical Committee. Physicians, resident doctors and interns participated in the study. The concept of the study was explained to all subjects and their consent was sought.

A total of 74 mobile phones and 74 pens randomly sampled from the users of those were examined. Two swabs from each mobile and pen [Total = 296 swabs] were taken aseptically using sterile cotton swabs moistened with saline by rotating the swabs on the screen, keys, mouthpiece, earpiece and back-panel of the mobile and on the body and cap of the pen.

First swab each from mobile and pen was inoculated directly onto blood agar and MacConkey agar plates and incubated aerobically at 37^0 C for 18-24 hours.[3]

Second swab each from mobile and pen was inoculated into Nutrient broth and incubated aerobically at 37^0 C for 2 hours. Further subcultures were done on blood agar and MacConkey agar plates and incubated aerobically at 37^0 C for 18-24 hours.[3]

The samples were processed and the isolates were identified by standard microbiological procedures.[4]

Results: Out of 74 mobile phone samples, 28 (37.83%) were contaminated with bacteria. *Coagulase negative Staphylococcus* was found to be most common. [Table -1]

Table 1: Bacterial isolates from mobile phones

Isolates	Number Of Isolates (%) n = 28
Coagulase negative Staphylococcus	09 (32.15)
Micrococci	08 (28.57)
Acinetobacter spp	07 (25.00)
Staphylococcus aureus	03 (10.71)
Pseudomonas aeruginosa	01 (03.57)
Total	28

A total of 22 (29.73%) out of 74 pens showed bacterial contamination. *Coagulase negative staphylococcus* accounted for the majority of positive isolates. [Table - 2]

Table 2: Bacterial isolates from pens

Isolates	Number Of Isolates (%) n = 22
Coagulase negative Staphylococcus	9 (40.91)
Micrococci	8 (36.36)
Staphylococcus aureus	2 (09.09)
Acinetobacter spp	2 (09.09)
Pseudomonas aeruginosa	1 (04.55)
Total	22

Discussion: Hospital acquired infection rates remain an ongoing concern to healthcare professionals. As early as in 1861, it was demonstrated that microorganisms were transmitted to the patient by the contaminated hands of health care workers.[5] Today, India has 287 million mobile phone users and this account for 85% of all the communications users. In the health care setting, they are essential for quick and easy access to laboratory and imaging results, for consultations and sometimes for life threatening emergencies.

Local and National policy documents have provided guidance on hand washing, surface decontamination and cleaning of devices within clinical areas, yet there has been little guidance offered on the safe use of mobile phones within the healthcare environment. Tablet computers and touch screen phones have gained increasing prominence on hospital wards and clinical settings, yet they have been identified as a potential reservoir for nosocomial infections.[6] Present study was carried out to gain an understanding of the level of contamination on mobile phones and pens of health care workers to devise strategies for their safe use within clinical setting.

In our study, mobile phone and pen contamination rates were found to be 37.83% and 29.73% respectively which are comparable to the observations of previous studies. Arora U *et al* [7] found bacterial contamination rate of 40.62% in mobile phones and also stated that an average cell phone is dirtier than either a toilet seat or the bottom of your shoe.

Jayalakshmi *et al* [8] screened 84 cell phones belonging to doctors in clinical and 60 cell phones belonging to doctors in the pre and para clinical department for bacterial isolates. Except for the 12 new cell phones, all the others (91.6%) were found to be contaminated. The most common contaminating pathogens were *Coagulase negative Staphylococci.*

Gill PK *et al* [9] found that 37(49.3%) out of 75 pens showed growth and *Coagulase negative Staphylococci* was the most common isolate obtained from 8(10.6%). Bhat GK *et al* [10] found 26 (34.6%) out of 75 pens studied, were contaminated with bacteria.

A study conducted in New York and Israel reported that mobiles of HCWs were contaminated with various micro organisms, including nosocomial pathogens.[11] Many studies also reported that gram positive cocci (GPC) were isolated more than gram negative bacilli (GNB). This is because of differences in survival time i.e. half life of GNB is less than an hour, whereas GPC can survive longer.[12] Present study concurs with their findings. Although organisms like *Micrococci* isolated in present study are considered saprophytic or commensal organism, it can be an opportunistic pathogen, particularly in an immunocompromised hosts.

A significant percentage of isolates were potentially pathogenic *Acinetobacter* species are important agents of health care associated infections that can remain alive on various intimate surfaces and are frequently observed, especially in Intensive Care Units.[13] The implication of the findings is that mobiles and pens might be a vector playing an important role in the transmission of potential pathogenic microorganisms.

Conclusion: To conclude, mobiles and pens are potential reservoir for bacteria. They might be a vector playing an important role in the transmission of potential pathogenic microorganisms. The risk of transmission can be reduced by using alcohol-based sanitizing agents for wiping mobile and pen. Effective hand hygiene in clinical areas is the most effective means of ensuring the safe use of them.

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