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SURVEY OF PREVALENCE AND TYPES OF BACTERIAL CONTAMINATION OF MOBILE PHONES OF PERSONNEL EMPLOYED IN MAJOR WARDS OF EDUCATIONAL HOSPITALS IN YASUJ

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ABSTRACT

Background: Nosocomial infections are a growing cause of illness and death in humans that a high percentage of them are caused by bacteria. Contaminated surfaces of Environment play an important role in the pathogenesis of nosocomial infections. Mobile phone as a tool widely used in hospitals and due to high temperature and humidity act as a microbial source And creates an environment for microbial growth. The aim of the present study was to investigate the contamination of mobile phones and health personnel in major ward of Yasuj hospitals.

Materials and Methods: This study is a cross-sectional study was completely random on 93 subjects. Sampling were with a wet and sterile swab from personnel departments of major hospitals Yasouj And to evaluate the possibility of bacterial growth, the cultures were obtained, and ultimately the growth of microorganisms were identified by biochemical tests.

Results: The results showed that 88.2% of mobile phones by major department staff have been contaminated by bacteria. Most organisms have been found coagulase-negative staphylococci (69.9 percent) and Staphylococcus aureus has been found in 18.3% of cases.

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Also, 18.3 percent of mobile employees who were infected with Gram-negative bacteria Ecoli (12.9 percent) most Gram-negative bacteria were found the Klebsiella (1.1%),Enterobacter (1.1%) and Proteus mirabilis (3.2%).

Conclusion: The results of this study prevalence of mobile staff of Yasuj hospitals high and according to the everyday use of mobile phones in hospitals and their role in the reproduction and transmission of microbial agents in the role of a public health threat is more pronounced. So, employing different ways to control the growth of bacteria, including restricting the use of mobile phones in hospital and washing hands after using the cell phone is necessary.

Keywords: mobile phone, bacterial infection, hospital staff

INTRODUCTION

Hospitalized patients are usually at risk for infection (1). Hospital infections are infections that occur after hospitalization (48 to 72 hours later) or during a specific period after discharge (10 to 30 days) (2). Approximately 10% of hospitalized patients are hospitalized (2).Hospital infections are one of the leading causes of disease and mortality in humans (3). Annually, two million people are infected with treatment centers, of which 90,000 are dying. Most reported infectious diseases were from Southeast Asia and the Eastern Mediterranean (4), and at least 90% of the acquired infections from the hospital were diagnosed by bacteria (5).

Contaminated surfaces play an important role in the pathogenesis of hospital infection (6). One of the most common ways of transmitting hospital infections is through the hands of nurses and hospital staff (7).The source of hospital infections can be hospital staff, self-contained flora, or hospital equipment. The hands of health care personnel are predominantly infected with opportunistic infections and poor hand washing is a major contributor to the pathogenesis of hospital infection, and all the devices that are constantly in contact with the hands can be infected through the hands (8) . Also, these hands and contaminated equipment are transmitted to patients directly and during examination of organisms.Today, mobile phones are one of the essential tools of social and professional life, and mobile, in addition to voice calling, provides services such as the Internet, SMS, picture messaging, etc. (9). The use of mobile phones has become global today, and the extent to which it is used in the hospital and outside it is the same (10). Currently, the Asian continent has the most mobile use (11).The mobile phone acts as an environment for the growth of microbes, especially at high temperatures and humidity, mobile phones have become a microbial source that can be

transmitted to humans, with about 40% of cell phone users being hospitalized. In a hospital, they are infected with pathogenic bacteria (11).

Because of its frequent communication with the hands, the cell phone can cause infectious diseases and can transmit it to others (12), and, conversely, mobile phones can act as a source for microorganisms. The mobile phone can also have more than one toilet seat, handles or micro-body shoes (13).Some studies have pointed to the possible role of mobile phones and other devices (such as toys in the pediatric ward) in the transmission of hospital pathogens among health care workers (14).Mobile phone calls with hand and heat produced by the phone create a good breeding environment for many types of microorganisms (15).

Some researchers report that 99 percent of cell phones in healthcare workers in developing countries are infected with bacteria, of which about 65 percent are pathogenic bacteria, given that providing the best health services today is not only an important national issue, but also a The major investment is for the future (16). Considering the high prevalence of nosocomial infections and its relation to the most commonly used infected and mobile devices and the prevalence of hospital-resistant organisms in the community, we aimed to investigate the contamination of mobile phones Health care personnel of the hospitals of Yasuj.

MATERIALS AND METHODS

This study is a descriptive cross-sectional study with the aim of determining the prevalence and type of bacterial contamination of mobile phones of personnel employed in major departments (internal, pediatric, surgical, and women's) of Yasuj educational hospitals.In this study, the sampling was carried out in a categorical manner in such a way that each major section was considered as a class and was selected from among the classes in relation to the sample population (93 samples) and after speaking with the personnel Employed in major parts of hospitals, mobile personnel were randomly sampled and transferred to the laboratory after being transferred to the culture medium for microbial culture.

PROJECT IMPLEMENTATION METHOD

At first, three sessions were sent to major departments of educational hospitals of Yasuj medical university. After talking with the personnel employed in the departments, all personnel interested in participating in the study were invited to collaborate. Then, each questionnaire has a code containing details and questions about how to use the mobile phone. After completing the questionnaire, a sampling of personnel from mobile phones was performed. Sampling was first applied to a sterile salt drip of a sterile swab and then pulled

out on all surfaces from the cell phone.The swabs were transferred to Stewart's transfer medium and transferred to the laboratory microbiology section, then cultured on an agar culture medium and EMB (with the same code as the questionnaire code). After 24 hours of incubation at 37 ° C, single colonies grown in the agar and EMB medium were cultured in a nutrient agar medium.24 hours after incubation, isolated bacteria were stained with warm water. Staphylococcal and Streptococcus catalase tests were performed to differentiate colonies with cytokine-positive morphology.First, a drop of hydrogen peroxide was deposited on the slurry, then with a sterilized swab, a colony was dissolved, and a catalase-positive test was considered in the case of bubble formation. For the detection of Staphylococcus aureus from other staphylococci, catalase-positive bacteria were cultured on a manitol salt agar medium. A coagulase test was carried out after a one-night nocturnal period at 37 ° C to confirm staphylococcus aureus (coagulase positive) for positive manitol specimens. By using a sterile loop, a colony with a few drops of citrate plasma was blended according to the manufacturer's instructions, and the Streptococcus aureus bacteria were reported when the clot was formed.

Specific biochemical differential tests including TSI, SIM, Urease, MR-VP, Citrat were used to determine the type of gram negative bacteria for isolated bacteria on nutrient agar medium.

After completing the questionnaires and obtaining the result of microbial culture, the data were analyzed by SPSS software version 18 and for describing the data, the central indicators and dispersion, frequency distribution tables and plotting were used.

FINDINGS

In this study, a total of 93 microbial culture samples were taken from mobile phones of personnel employed in major parts of the Yasuj educational hospitals.

Table -1: Contamination of mobile personnel

Contamination	Abundance	Percentage	Percentage of cumulative frequency
Positive bacterial contamination	82	88.2	88.2
Bacterial non-contamination	11	11.8	100
Total	93	100	100

As shown in the table above, 88.2% of mobile phones of personnel employed in major sectors have been infected by at least one bacterial species.

Table 2. Levels and types of gram-positive bacterial contamination

Gram-positive bacterial contamination	Abundance	Percentage	Percentage of cumulative frequency
Contamination with Staphylococcus Negative Coagulase	65	69.9	69.9
Contamination with Staphylococcus aureus	17	18.3	88.2
Non-contamination	11	11.8	100
Total	93	100	100

As shown in the table above, 88.2% of mobile phones were contaminated with Gram positive bacteria; the most found organism was Staphylococcus coagulase negative (69.9%). Staphylococcus aureus was found in 18.3% of cases.

Table 3. Rate and types of gram negative bacterial contamination

Gram-negative bacterial contamination	Abundance	Percentage	Percentage of cumulative frequency
Pollution with E-coli	12	12.9	12.9
Pollution with Klebsiella	1	1.1	14
Infection with Enterobacter	1	1.1	15.1
Contamination with proteus	3	3.2	18.3
Non-contamination	76	81.7	100
Total	93	100	100

As shown in the table above, 18.3 percent of the mobile phone staff was infected with gram-negative bacteria, the highest Gram-negative bacteria were found in E-coli (12.9 percent).

Also, Klebsiella (1.1%), Enterobacter (1.1%) and Proteus (3.2%) were found among other gram-negative bacteria.

The relationship between age and work experience with mobile bacterial contamination was tested using t-test and we tested the equality hypothesis for age and work history for age p.value = .169 and for work experience p.value = .405. Showed no significant relationship between age or work experience with cellular bacterial contamination. Also, we used a test of normality to determine the normal distribution of age and work history, and the age and work history were none of the normal distribution functions.

Finally, we used the mannwhitney U test to examine the relationship between age and work experience with mobile phone pollution, which was found for age p.value = .247 and for work experience p.value = .239, indicating no significant relationship between age and Work experience of mobile phone pollution.

DISCUSSION AND CONCLUSION

The mobile phone is a widely used device in the hospital and outside the hospital that provides a good environment for the growth and multiplication of different microorganisms and the transmission of microbial agents. The findings of this study and similar studies in different parts of Iran and the world show high rates of bacterial contamination in mobile phone hospital personnel. In the present study, 88.2% of mobile phones were staffed by at least one major bacterial agent. In a similar study conducted in Babul by BarariSavadkoohiet al, 67.7 percent of mobile phones had positive bacterial contamination, with the exception that 51 percent of mobile phones were medical personnel and 84.4 percent of mobile phones were non-medical staff Infected with bacteria.

Also in another study at the Jima Specialist Hospital in Southwest Ethiopia in 2014, Misgana et al. found that 86 percent of healthcare mobile phones and nearly 56 percent of mobile phones other than health workers were infected with bacteria.In this study, the percentage of contaminated mobile phones with gram-positive bacteria was higher than that of other studies. In our study, the highest bacterial strains found were Staphylococcus coagulase negative (69.9%), in the studies conducted by Alighardashi (56% Staphylococcus coagulase negative), the Haghbin (40% Staphylococcus coagulase negative) and Misgana (46.2% Staphylococcus coagulase negative) Staphylococcus aureus Negative coagulase was found to be the most common organism, while in studies carried out by BarariSavadkoohi (23.6% Bacillus) and Tagus (23% Bacillus), Bacillus was the most common Gram-positive organism. In the Sabah, Staphylococcus aureus was also found to be the most commonly found germpositive(45%).In

the present study, the most gram-negative bacteria were found in Oakley (12.9%), which was found to be the most common gram-negative bacterium in studies conducted by Barari Savadkoohi (4.7% E-coli), Alighardashi (4% E-coli), although in the study of right and Associates of Enterobacter (6%) and in the study of Tago et al (19%), the most gram-negative bacteria were found.

In the present study, no significant correlation was found between mobile phone pollution and none of the variables including age, sex, and occupation, level of education, work experience, and service area. Different findings were obtained in similar studies. There was no significant relationship between sex education and cellular bacterial contamination in the study of Barari Savadkoohiet al., but with the increase in education, the rate of infection was reduced so that medical students and specialized assistants had the least pollution.In Alighardashi et al., The rate of bacterial contamination in physicians and medical students was higher than nurses and nurses.Also, Sabbah et al. Did not show any significant correlation between gender and cellular bacterial contamination.

In the present study, there was no correlation between mobile phone pollution and the frequency of mobile phone cleaning, but in the study of Ebrahim Badr, after washing hands with alcohol, the amount of contamination was zero, but after touching the cell phone, the amount of contaminated hands was higher than 90% Receipt.In this study, the bacterial contamination of mobile phones of the major department of educational hospitals of Yasouj University of Medical Sciences was high and the rate of infection was high as in other studies. Considering the daily use of cell phones in the hospital and their role in proliferation and transmission of factors the microbial role of this device is more pronounced in the health of the community, and the need for more attention to clean up cell phones or limiting their use in the hospital makes it clear.

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