

Original Research Article

## **Bacterial Isolates from Mobile Phones of Health Care Workers in a Tertiary Care Hospital, Hyderabad**

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**Abstract:** Mobile phones of health professionals can harbour various potential pathogens and can become source of infection for the patients, self and for family members. The purpose of the study is to isolate and determine the resistance pattern of bacteria from mobile phones of health care workers working in ICUs. A sterile cotton swab moistened with sterile normal saline was rolled over exposed surfaces of mobile phones and used for inoculating on Blood agar and MacConkey's agar and inoculated plates were incubated aerobically for 18- 24 hours at 37<sup>0</sup> C . Identification of isolates was done by Gram's staining and standard biochemical reactions . Antibiotic sensitivity was put up on Mullen Hinton agar by Kirby Bauer disk diffusion method. Oxacillin disk was used for Methicillin Resistant *Staphylococcus aureus* detection. Mobile phones of 20 doctors, 25 nurses, 5 ward boys and 5 safai karmacharies were included in the study and 20 mobile phones of non health care workers were taken as controls. Bacteriological analysis revealed that, 40 mobile phones of health care workers and 12 mobile phones of non health care workers were contaminated with bacteria .Organisms isolated were CONS, MRSA, MSSA, Micrococcus and ASBs. Development of effective preventive strategies such as hand hygiene, regular decontamination of mobile phones can prevent spread of infections.

**Keywords:** : Mobile phone, pathogens, *Staphylococcus aureus*

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### **INTRODUCTION**

Now a days, mobile phone is being widely used as one of the indispensable accessories and its usage has increased dramatically worldwide. Despite the potential benefits of mobile phone in facilitating communications, this device has been considered as one of the most important factors that threatens human health like transmission of microorganisms [1]. This is important in health care centers where mobile phones have become part of health professional's equipment and are used extensively for communication in clinical settings. They are seldom cleaned and are often touched during or after examination of patients and handling of specimens without proper hand washing [2].

Research has shown that the mobile phone could constitute a major health hazard .The combination of constant handling and the heat generated by the phones creates a breeding place for all sorts of microorganisms that are normally found on our skin [3].

Hospital acquired infection caused by multidrug resistant gram positive organisms such as

*staphylococcus aureus* are a growing problem in many health care institutions [4].

The present study was conducted to determine bacterial colonization on mobile phones and their resistance pattern used by health care personnel in intensive care units.

### **AIMS AND OBJECTIVES**

The present study was aimed at isolation of bacteria and determine their antibiotic susceptibility pattern from mobile phones of health care workers from intensive care units and non health care workers.

### **MATERIALS AND METHODS**

After Institutional Ethical Committee approval this study was carried out in duration of three months, with written informed consent. Samples were collected from 50 mobile phones of health care workers working in intensive care units and 20 from patient attenders who were regarded as non health care workers and who served as controls in the study. Sterile swabs dipped in sterile saline were rolled over exposed surfaces of mobile phones and was inoculated on Blood agar and

Mac Conkey 's agar. Inoculated plates were incubated at 37<sup>0</sup>C for 18-24 hours. Preliminary identification of bacteria was made based on Gram reaction, colony characteristics, haemolysis on blood agar ,and changes in physical appearance in differential media. Based on the gram staining further identification of bacteria was made by a series of biochemical reactions. Antibiotic susceptibility test of the isolates was done by Kirby-Bauer disk diffusion test on Muller-Hinton agar. The isolated bacteria was suspended in nutrient broth and incubated for 30 minutes to make it comparable with 0.5 McFarland standard . After incubation a sterile cotton swab was dipped in to the suspension and bacteria were inoculated on to the Muller-Hinton agar. Antibiotic discs were placed by using disc dispenser and plates were incubated for 24 hours at 37<sup>0</sup>C. The sensitivity pattern was determined by measuring the

zone of inhibition with a calibrated ruler and interpreted according to standard guidelines. Oxacillin disc was used to detect Methicillin Resistant *Staphylococcus aureus*.

**RESULTS**

The rate of bacterial contamination of mobile phones of health care workers in this study was 92% and that of non health care workers was 70%. There was significant difference between growth from mobile phones of health care workers and non health care workers. Table 1 reflects the percentage of growth from mobile phones of health care workers and non health care workers. Among various cadres of health care workers there was no much difference in the growth and organisms isolated.

**Table 1: Percentage of growth from mobile phones of health care workers and non health care workers**

	Growth obtained	No growth	Total
Health care workers	46(92%)	4(8%)	50
Non health care workers	14(70%)	6(30%)	20

Bacterial isolates contaminating mobile phones of both health care workers and non health care workers were observed as reflected in Table 2. Coagulase negative staphylococcus was the most frequently isolated organism among health care professionals and

non health care workers followed by *Staphylococcus aureus*. There was significant difference between health care workers and non health care workers in isolation of methicillin resistance staphylococcus.

**Table 2: Isolated organisms from mobile phones of health care workers and non health care workers**

Organism isolated	Health care workers	Non health care workers
CONS	22	6
MSSA	12	5
MRSA	5	-
Micrococci	4	2
Aerobic spore bearers	3	1

Organisms isolated from non health care workers were sensitive to most of the drugs were as organisms from health care workers were resistant to few drugs. Table 3 shows antibiotic sensitivity patter of organisms isolated.

**DISCUSSION**

The hospital environment plays a critical role in the transmission of microorganisms associated with hospital acquired infections. Microorganisms can be transferred from person to person or from inanimate objects to hand and vice versa<sup>4</sup>. The health care workers mobile phones can provide a reservoir of bacteria known to cause nosocomial infections and due to optimal preventing transmission of infection to patients, accurate determination of the different types of isolates is necessary.

In this study 92% mobile phones of health care workers and 70% mobile phones of non health care

workers showed growth. Usha Arora *et al* [2] study, 91.6% of phones demonstrated evidence of bacterial contamination with different type of bacteria. Uglar *et al* [7] observation showed 94.5% of phones demonstrated evidence of bacterial contamination with different types of bacteria. In 8. Tambe NN *et al*[9] observation 90.98% of mobile phones of health care workers showed contamination with various bacteria.

In the present study Coagulase negative staphylococcus was predominant organism isolated both from health care workers and non health care workers. In the similar study conducted by Usha Arora *et al* [2] Coagulase negative staphylococcus was the predominant organism isolated. Datta P *et al* [5] showed isolation of only gram positive organisms and Similar studies conducted by Brady RRW *et al* [6], UK and Karabay O *et al* .[9], Turkey suggested that the isolation of gram negative bacilli from the

mobile phones was less i.e. 4.76% and 7.2% respectively.

#### CONCLUSION

As restriction of using mobile phones while working hours is not the practical solution of the problem, we recommend simple measures like hand washing, cleaning of mobile phones with 70% isopropyl alcohol, well controlled infection control plan and regular training to health care workers to reduce the hospital acquired infection.

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