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BACTERIAL CULTURE FROM CELL PHONES USED BY HEALTH CARE WORKERS IN DIFFERENT ICUS IN A MULTISPECIALTY HOSPITAL IN KERALA.

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ABSTRACT Cell phones are increasingly used by Health Care Workers (HCW). Dr.Moopen's Medical College is a 450 bedded tertiary care hospital in Wayanad, Kerala. We cultured sample from 100 cell phones used by HCWs in various ICUs in the hospital. The swab was pre-enriched in thioglycollate broth overnight and were processed using conventional culture methods. Ninety two samples (92%) were grown some bacteria. Half of our samples were Coagulase Negative Staphylococcus (50%) and one forth of samples (25%) were Aerobic Spore Former. Eighteen percent samples were Gram Negative Bacilli, including 7 Enterobacter of which 2 were ESBL producers. There should be a decontamination protocol for cell phones.

KEYWORDS : Gram negative bacilli, ESBL producers, HCW,

INTRODUCTION

Cell phone is an indispensable device carried and used by all categories of people. Health Care Workers (HCW) are not an exemption. What has proved to be an advent of technology is also the source of many Hospitals acquired infections (HAI) (1,2). Only some hospitals have a policy against using personal cell phones during patient care. Strict hand hygiene protocols are being implemented and practised by HCWs in an attempt to reduce the risk of HAIs. It is common to see HCWs using their cell phones with gloves. There are reports of bacteria isolated from cell phones in hospital settings (1, 2). As HCWs are constantly engaged with patients, these bacteria can frequently transfer as the temporary flora of the hands of HCWs and subsequently to the patients. This can also include multidrug resistant bacteria (3).

HAIs are particularly common in ICUs. Proportionately it is also the place where the cell phone usage is more rampant. We carried out a study by culturing bacteria from samples collected from cell phones belonging to ICU staff. We hypothesized that dangerous bacterial pathogens could be isolated from the cell phones of HCWs in ICU.

Dr .Moopen's Medical College Hospital is a 450 bedded hospital in North Kerala, which is serving as a tertiary care centre in the district of Wayanad, Kerala. The Hospital has 4 ICUs in which we are planning to carry out this study. They include Neonatal ICU, Paediatric ICU, Surgical ICU, Medical ICU. We collected culture samples from the cell phones (n=100) of HCWs in ICU. Identification and antimicrobial susceptibility testing was done from isolates. The results were analysed.

We cultured from 100 cell phones of HCW from various ICUs, determined the identification and antimicrobial susceptibility testing, this was done during the months of May and June, 2023.

Methodology

Sample collection: We did an epidemiological cross-sectional study. We took necessary permission from the Medical Superintendent and ICU Chiefs of NICU,PICU,SICU and MICU. We got the approval from Institutional Ethics committee. The team members of the study went to the ICU towards the end of a shift. After explaining the procedure and requesting the willingness of the study an oral consent was taken. Anonymous samples were taken (and results cannot be traced back) to improve the participation of HCWs. HCWs who are having 2 cell phones and those having a habit of decontaminating the cell phone they were excluded from the study. Each day 10 samples were taken from the cell phones by a sterile swab which is wetted by sterile peptone water. The part of the cell phone which is most frequently used, like the on-off switch, were smeared meticulously.

Sample Processing: The swab were transported to the laboratory. In the laboratory the swab was immersed in a 3ml thioglycollate broth and aerobically incubated at 37°C for 18hrs. Next day the thioglycollate broth was noted for turbidity. The broths showing turbidity were inoculated onto a full plate Blood agar and MacConkey agar and incubated aerobically at 37°C overnight. The bacterial isolates grown next day was processed as an exudate sample. Any beta haemolytic growth on blood agar were followed up. Similarly any growth on Mac Conkey agar will be followed as Gram Negative Bacilli. Identification and antimicrobial susceptibility testing were carried out. Identification of Staphylococcus aureus was done by using Tube Coagulase test and Mannitol fermentation. Gram Negative Bacilli was subjected to Oxidase test and a battery of test commonly known as MMTPC. This is an abbreviation for Mannitol Motility, Triple Sugar Iron test, Indole test and Citrate utilization test. Using these biochemical bacterial tests organisms like E.coli, Klebsiella, Citrobacter, Proteus, Pseudomonas and Acinetobacter can be identified. Commonly these bacteria are isolated from cell phones previously (4). Antimicrobial Susceptibility test were done using Kirby-Bauer Method. The results analysed using EPIInfo programme.

Sample Size Calculation: Done using EPIInfo programme. We calculated the (HCWs in all 5 ICUs), expected frequency 80% and margin of error 5%. For 90% confidence interval we got sample size of 93 and 95% confidence interval sample size of 110. So we selected 100 as our feasible sample size.

Consent: The participation in the study was voluntary, testing was done anonymously ie, the result could not have traced back to the owner of the cell phone. All these were explained during sample collection. Participants to took part were considered as implied consent given.

RESULTS

Among the cultures done 92 (92%) has grown some bacteria. The Coagulase Negative Staphylococcus has grown in 50 (50%) cultures. The next most grown bacteria was Aerobic Spore Former has grown in 25 (25%) cultures. Gram Negative Bacilli is grown in 18 (18%) samples. Of these, 7 were Acinetobacter, 7 were Enterobacter and another 4 samples were Nonfermenting Gram Negative Bacilli. Eight samples has grown 2 different bacteria. When we looked at the Antimicrobial Susceptibility Test, two samples had ESBL Enterobacter. Other bacteria was generally sensitive to most antibiotic.

CONCLUSION

Bacterial culture from cell phones used by HCW is not new (1-5). A similar study noted Staphylococus aureus in 31.8% of samples and

Klebsiella/ E.coli in 9.1% of their samples (2). Another study from Peru done on medical students indicated the strains which produced ESBL were 72.3% were isolated. (1). We cultured swabs taken from cell phones of HCWs working in ICUs in between their busy schedule. Enterobacter is a common isolate from the endotracheal aspiration samples in our hospital. In our hospital nurses are not allowed to use their personal cell phones.

In conclusion half of our samples were Coagulase Negative Staphylococcus and one forth of samples were Aerobic Spore Former. Eighteen percent samples were Gram Negative Bacilli, including 7 Enterobacter of which 2 were ESBL producers. This points that cell phones can be a vehicle for spread of bacteria. There is a need of decontamination procedure for cell phones similar to the hand hygiene to be implemented.

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