Valley International Journals
Open Access Journal

International Journal Of Medical Science And Clinical Inventions
Volume 3 issue 9 2016 page no. 2171-2174 e-ISSN: 2348-991X p-ISSN: 2454-9576
Available Online At: http://valleyinternational.net/index.php/our-jou/ijmsci

Unclean Stethoscope - A Tool For Hospital Acquired Infection

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Abstract: Indirect transmission of infection through stethoscopes is a part of nosocomial infection. It can be reduced by cleaning stethoscopes with 70% isopropyl alcohol routinely. Aims and objectives i) whether stethoscope act as a vector for HAI ii) to see effectiveness of commonly used antiseptic and iii) to check the cleaning habits of health care providers of their stethoscopes . Methods- The samples were collected from 65 stethoscopes of health care personnel working in different hospitals and Inoculation were obtained by pressing the diaphragm surface firmly on blood agar plate and MacConkey's agar plate. Identification of organisms and antibiotic susceptibility testing were determined by standard conventional methods. Result- 31 pathogenic organisms were isolated from 65 stethoscope diaphragm. Most commonly isolated organisms were Coagulase negative Staphylococcus (15.40%). Five out of 31 pathogenic organisms were multidrug resistant. Conclusion- Routine cleaning of stethoscopes reduces the bacterial load and it should be a part of infection control practice.

Key word- *Stethoscope, hospital acquired infection, infection control*

Introduction: Healthcare associated infection (HAI) is a critical problem of each hospital increase the morbidity, mortality, duration of hospital stay and cost of treatment.[1] The incidence of nosocomial infection in India is 17.7%. [2] Indirect transmission through fomites include stethoscopes, thermometer, blood pressure cuff, respiratory devices, gloves, gown etc.[3] Stethoscope is most commonly used in clinical practice. But disinfection of stethoscope is not routinely practiced. [4]Organisms on such instruments may remain viable for days.[5] Multidrug resistant organisms and immunocompromised patients increase the risk of HAI. Taking care of stethoscope hygiene as well as patient's reduces the chances of HAI. Simple regime like 7 steps of hand washing, cleaning stethoscope with 70% isopropyl alcohol before and in between patients examination, use of gloves, mask, gown, proper antibiotic policy can lower the risk.[6] The aims and objectives of the study are i) whether stethoscope act as vector for HAI ii) to see effectiveness of commonly used antiseptic and iii) to check the cleaning habits of health care providers of their stethoscopes.

Materials and Methods-

This is a prospective surveillance study. The samples were collected from 65 stethoscopes of health care personnel working in different hospitals of Burdwan district, West Bengal. For comparison, samples were also taken from 15 stethoscopes which were cleaned by 70% isopropyl alcohol and air dried after cleaning. Inoculation were obtained by pressing the

DOI: 10.18535/ijmsci/v3i9.14

diaphragm surface firmly on blood agar plate and MacConkey's agar plate . The plates were incubated aerobically at 37°C for 48 h. An uninoculated plate was incubated side by side as a quality control. Colony-forming units (CFUs) were counted and identification of organism were done according to their colony morphology and biochemical characteristics. Antibiotic susceptibility testing were determined using the Kirby-Bauer's disk diffusion method.

Results-

Sixty two different organisms isolated from 65 health care provider's stethoscopes from different wards, ICUs and outdoor. Out of 62 organisms, 31 organisms are pathogenic and 31 are non-pathogenic. The Pie diagrams showing distribution of the organisms [Figure 1 and Figure 2]. Only 3 culture plates showing no growth. The colony count ranges from 10 to 50. The Bar diagram showing the department wise distribution of stethoscope sample [Figure-3]. Minimum number of colonies arise from the stethoscopes of PICU dept. and maximum number of colonies arise from the stethoscopes of Orthopaedics and Gynaecology dept. Most commonly isolated organisms were Coagulase negative Staphylococcus15.40% (CoNS) followed by Methicillin sensitive Staphylococcus aureus7.70% (MSSA). Sensitivity pattern of CoNS isolates are stated in Figure 4. Five out of 31 pathogenic organisms were multidrug resistant. Percentage of organisms varied in different tier of designation of health care provider [Table-1].More number of organisms isolated from the stethoscope of residents and interns followed by consultants and nurses. Fifteen stethoscopes sample were imprinted after disinfecting with 70% isopropyl alcohol to show the efficacy of disinfection. Four were culture positive (26.66%) [Table-2] It also showed the significant reduction in colony count(<5).

Figure-1: Pie diagram showing distribution of Non-pathogenic isolates from stethoscopes

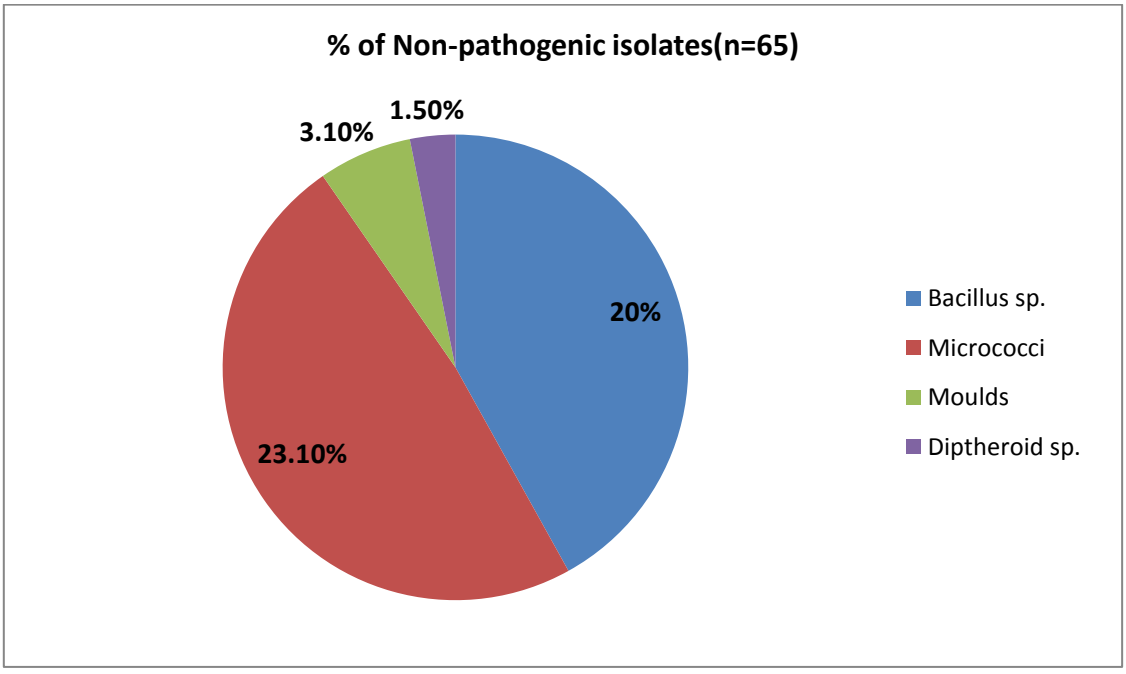

Figure-2: Pie diagram showing distribution of pathogenic isolates from stethoscope

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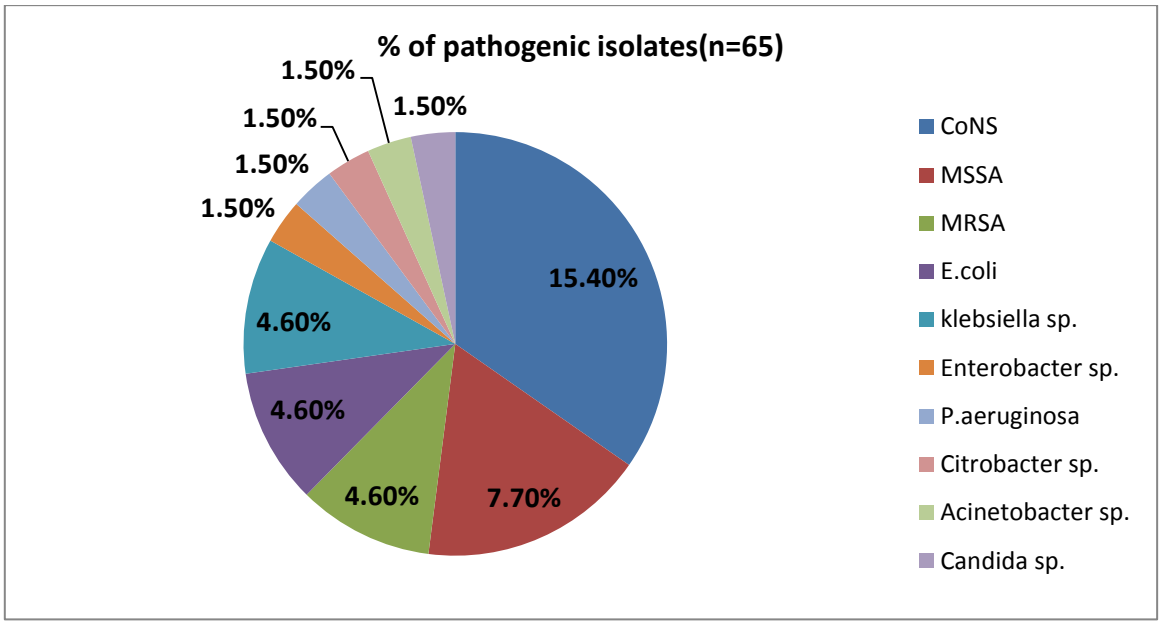

Figure-3: Department wise distribution of stethoscope samples

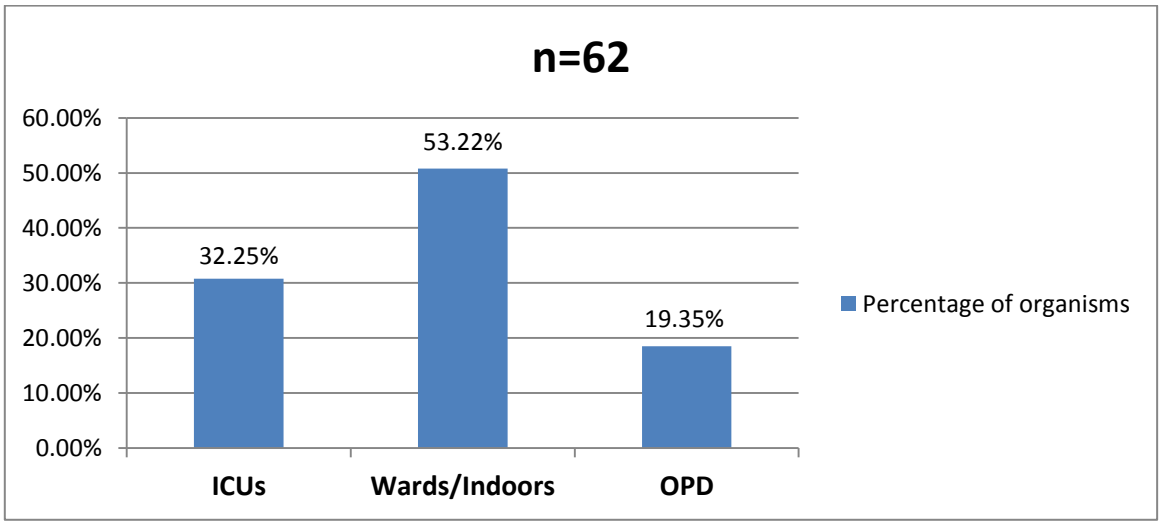

Figure-4: Antibiotic susceptibility of CoNS

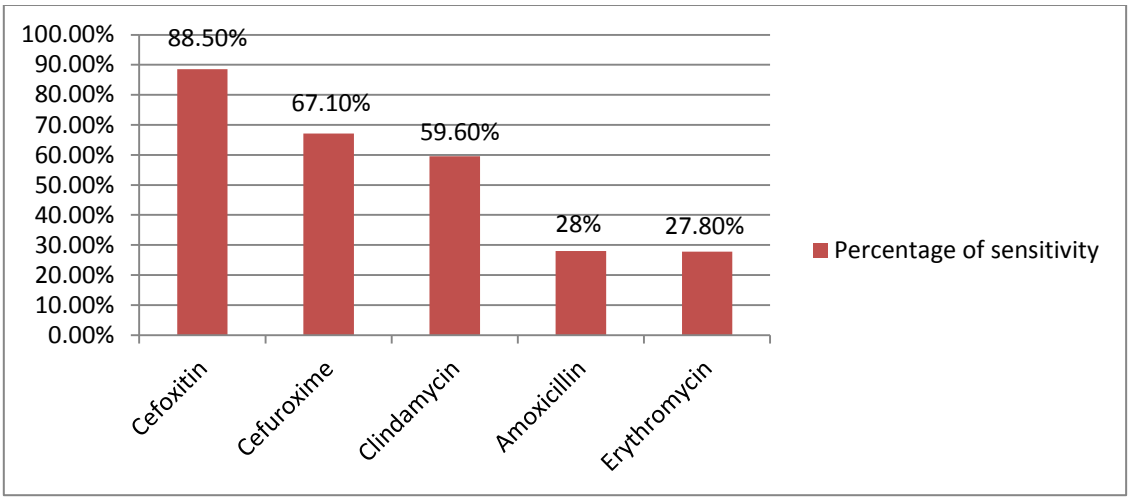

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Table 1: Distribution of organism according to designation

Designation	No. of samples (%)
Consultant	15(24.19%)
Residents	21(33.87%)
Interns/House staffs	17(27.41%)
Nurse	9(14.51%)
Total=62(100%)	

Table 2: Culture results before and after disinfection with 70% ethanol

Number of stethoscopes cultured	Before disinfection Culture-positive stethoscopes(average no. of colonies 30)	After disinfection Culture-positive stethoscopes(average no. of colonies 4)
65 random +15 cleaned	62 (out of 65)	04(out of 15)

Discussion-

Many investigations are there on same issue however prevention is not satisfactory. It should be a part of infection control practice. In our study, among isolated organisms Coagulase negative Staphyloccus are maximum in number(15.40%) followed by methicillin sensitive and resistant Staphylococcus aureus. Isolated CoNS showed resistant antibiotic susceptibility pattern. Few Gram negative bacilli also isolated from stethoscopes of post operative ward and neonatal intensive care unit. Immuno compromised state, breach of continuity of skin facilitate the infections.[7] It is also noticed that ,cleaning of diaphragm of stethoscopes with 70% isopropyl alcohol reduces the bacterial count.[8]

Conclusion-

Not only diaphragm but also bell and earpieces should be cleaned in between patients by simple measures as a part of infection control. It should be kept in mind that stethoscopes can also spread infection outside hospital.

References-

1. Campos-Murguía A , León-Lara X, Juan M. Muñoz , E. Macías. A , José A. Álvarez .Stethoscopes as potential intrahospital carriers of pathogenic microorganisms. American Journal of Infection Control 2014;42: 82-3

2. Mythri H and Kashinath KR. Nosocomial infections in patients admitted in intensive care unit of a tertiary care centre, India. Ann Med Health Sci Res 2014;4(5):738-41

3. Gupta N, Gandham N, Misra R N, Jadhav S, Ujgare M, Vyawahare C. The potential role of stethoscopes as a source of nosocomial infection. Medical Journal of Dr. D.Y. Patil University 2014 |;Vol 7(2): 156-59

4. Kilic I H, Ozaslan M, Karagoz I D, Zer Y, Savas E and Davutoğlu V. The role of stethoscopes in the transmission of hospital infections. African Journal of Biotechnology 2011;10(30): pp. 5769-5772

5. Hota B. Contamination, disinfection, and cross-colonization: are hospital surfaces reservoirs for nosocomial infection? Clin Infect Dis 2004;39:1182-9.

6. Visalachy S, Kumar K, Kopula S S, Sekar U. Carriage of Multidrug Resistant Bacteria on Frequently Contacted Surfaces and Hands of Health Care Workers. Journal of Clinical and Diagnostic Research. 2016;10(5): 18-20

7. Mark W. Wood, RRT, BS, Ryan C. Lund and Kurt B. Stevenson Boise, Idaho. Bacterial contamination of stethoscopes with antimicrobial diaphragm covers.AJIC 2007; 35(4):263-66

8. Sood P, Mishra B, Mandal A. Potential infection hazards of stethoscopes.
J Indian Med Assoc 2000;98:368-70.

DOI: 10.18535/ijmsci/v3i9.14