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Common Contaminants of Bacteriology Laboratory: Microbiological Paramores

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ABSTRACT: *Frequent environmental contaminants within microbiology laboratory create not only diagnostic dilemmas but also poses major risk for health care workers and patients. Objective of our study was to isolate and identify the common laboratory contaminant bacteria with an ultimate goal to reduce false positive culture reports as well as Laboratory acquired infections. The study was conducted in Microbiology laboratory of a tertiary care hospital over a period of six months. A total number of 100 samples were collected from different areas of laboratory including air, surfaces, hands and clothing of the laboratory personnel by settle plate method, surface swab method, fingerprint impressions and sweep plate method respectively using pre incubated Mac-conkey's and Blood agar plates, incubated overnight at 37 ^{0}c. The next day, discrete colonies were further studied by standard Microbiological protocols. Indeterminant biochemical results were confirmed with Biomeriux VITEK-2 AES. Out of 100 collected samples, growth was observed in 34 (34%).Out of 34 culture positive samples, Micrococcus was isolated in 18(52.94%) followed by Bacillus subtilis (confirmed by VITEK-2 AES) in 8 (23.52%). Diphtheroids were isolated in 4 samples (11.3%). Staphylococcus epidermidis was isolated in 3 cases (8.8%) and in one sample, Staphylococus aureus was isolated. Micrococcus spp. were obtained mainly from surfaces (66.67%) whereas Bacillus subtilis was from air (75%). Precaution should be taken to get rid of these organisms from laboratory by means of proper laboratory disinfection and sterilization as well as personal hygiene of laboratory workers.*

KEY WORDS: *Laboratory-contaminant, Surface, Air, Hand and Clothing, Micrococcus, Bacillus subtilis*

I. INTRODUCTION:

Frequent environmental contaminants within microbiology laboratory create not only diagnostic dilemmas but also poses major risk for health care workers and patients (1, 2). False positive culture reports from bacteriology laboratory are responsible for unnecessary and inappropriate administration of antimicrobials which ultimately gives rise to unwanted drug-resistant mutant strains; moreover laboratory contamination is a marker of quality control of hospital disinfection and sterilization policy. Blood culture in Bacteriological laboratory is mostly victimised of laboratory contamination. Clinical studies of bloodstream infections over 3 decades have provided guidelines for differentiating true pathogens from contaminants or organisms of unknown significance (3); however, a true "gold standard" for differentiating pathogens from contaminants does not exist (4). Moreover, the most common blood culture contaminants, coagulase-negative staphylococci (CONS), which were almost always such several decades ago , now are pathogens more frequently, and judging the clinical significance of this group of microorganisms in blood has proven to be especially problematic (5). Practical laboratory approaches to the workup of likely contaminants are therefore very important footstep to discriminate between the true pathogens and laboratory contaminants.

Objective(s):

Objective of our study was to isolate and identify the common laboratory contaminant bacteria with an ultimate goal to reduce false positive culture reports as well as Laboratory acquired infections.

II. MATERIALS AND METHODS:

The study was conducted in Microbiology laboratory of a tertiary care hospital over a period of six months. A total number of 100 samples were collected from different areas of laboratory including air, surfaces, hands and clothing of the laboratory personnel by settle plate method, surface swab method, fingerprint impressions and sweep plate method respectively using pre incubated Mac-conkey's and Blood agar plates, incubated overnight at 37°c. The next day, discrete colonies were further studied by Gram staining, Albert staining, tests for motility and battery of biochemical tests. Indeterminant biochemical results were confirmed with Biomeriux VITE-2 AES.

III. RESULTS:

Out of 100 collected samples, growth was observed in 34 (34%). Out of 34 culture positive samples, Micrococcus was isolated in 18(52.94%) followed by *Bacillus subtilis* (confirmed by VITEK-2 AES) in 8 (23.52%). Diphtheroids were isolated in 4 samples (11.3%). *Staphylococcus epidermidis* was isolated in 3 cases (8.8%) and in one sample, *Staphylococus aureus* was isolated.

Table-1: Number of different isolated bacteria from different samples

Samples	Micrococcus (No. of isolates)	Bacillus subtilis (No. of isolates)	Diphtheroids (No. of isolates)	Staphylococcus epidermidis (No. of isolates)	Staphylococcus aureus (No. of isolates)
Air	4	6	0	0	0
Surface	12	2	0	0	0
Hands	2	0	4	2	1
Clothing	2	0	0	1	0

Micrococcus spp. were obtained mainly from surfaces (66.67%) whereas Bacillus subtilis was from air (75%).

IV. DISCUSSION:

Environmental contaminants vary from laboratory to laboratory depending on the infection control measures and geographical distribution. Under reporting on this issue is relly a drawback. According to a study performed by Veena Kumari, of the 60 surfacesamples, 56 (93.4%) were contaminated by potentially pathogenic, environmental or pathogenic bacteria. Coagulase- negative staphylococci (CNS) was the peak contaminants, isolated (44.46%) from the patients' files categorized as potentially pathogenic. Gram positive bacilli (Corynebacterium spp) was the next common isolate (38%) categorized as environmental contaminant hence were deemed to be environmental flora (6) wherea in our study the commonest contaminant was Micrococcus was isolated in 18(52.94%) followed by *Bacillus subtilis* in 8 (23.52%).When these organisms are isolted from clinical samples, reporting should not be casual because inspite of being environmental contaminant, they have pathogenic potential specially in nosocomial and immunocompromised setup. Repeated and consistent isolation with clinicl correlation are required in these cases. More and more studies on this ground should be performed in different laboratory setup to determine the exact problem definition and its solution.

V. CONCLUSION:

Micrococcus spp. And aerobic spore bearers, i.e. *Bacillus subtilis* are the common contaminants of blood culture and other samples. So, precaution should be taken to get rid of these organisms from laboratory by means of proper laboratory disinfection and sterilization as well as personal hygiene of laboratory workers.

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