Aseptics used in Sample Collection for Blood Cultures

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Abstract:

Background: The term asepsis means the absence of potentially pathogenic micro-organisms. Medical asepsis aims to reduce the number of organisms and prevent their spread by use of standard principles of infection prevention. Antiseptics used for prevention of blood culture contamination, the combination of PI and IPA has been traditionally used in many institutions, the application of PI needs extra time, and there is little evidence that this combination could have an additive effect in reducing contamination rates. To elucidate the additive efficacy of PI, we compared two antiseptics, 70% IPA only and 70% IPA plus PI.

The objective of this study was to determine a single swab IPA or double swab IPA in combination of PI for blood sample collection technique in patients for clinical investigations to reduce the rate of contamination.

Materials and method: We conducted prospective study of all suspected cases of bacteremia among inpatients above 15 years of age in our tertiary care centre, phlebotomy procedures to the collection of blood samples for culture was done collecting paired samples with single swab and double swab.

Results: A total of 112 paired blood sample, yielded 91(81.2%) no growth, 14 (12.5%) yielded bacterial growth, 7(6.25%) yielded contaminants.

Conclusion: There was no significant difference in the contamination rates; the use of a single application of 70% IPA is a sufficient and a more cost- and time-effective method of obtaining blood samples for culture than the use of a combination of IPA and PI. No change in contamination rates among paired blood sample which suggest that the type of antiseptic used may not be as important as the use of proper technique.

Keywords: PI- povidone-iodine, IPA- isopropyl alcohol.

I. INTRODUCTION

The collection of blood samples for culture is essential for the diagnosis and management of patients suspected with bacteremia. Aseptic technique is a process or procedure used to achieve asepsis to prevent the transfer of potentially pathogenic micro-organisms to a susceptible site that may result in the development of infection. Healthcare workers who perform an aseptic technique should receive training in how to correctly perform the procedure; this should include a competency assessment.1 Asepsis is an essential component of infection prevention and control practice to protect patients from potential HCAIs (All steps in a non-touch aseptic technique should be seen as an opportunity to reduce the transfer of pathogenic organisms. Healthcare workers should be educated and trained in an aseptic technique that should include competency assessment and should be considered a core competency.2,3 70 % isopropyl alcohol solution kills microorganisms by dissolving plasma membrane of the cell wall. The plasma membrane of gram-negative bacteria consists of thin layer of peptidoglycan that easily destroyed by the alcohol. Therefore, 70 percent isopropyl alcohol is known as pharmaceutical alcohol. Isopropyl alcohol (2-propanol), also known as isopropanol or IPA, is the most common and widely used disinfectant within pharmacies, hospitals, clean rooms, and electronics and medical device.4,5 the antimicrobial action of povidone-iodine occurs after iodine disassociates from the complex. Once in the free form, iodine rapidly penetrates microbial cell membranes and interacts with proteins, nucleotides, and fatty acids in the cytoplasm and cytoplasmic membrane. Free iodine, slowly liberated from the povidone-iodine (PVP-I) complex in solution, kills cells through iodination of lipids and oxidation of cytoplasmic and membrane compounds. This agent exhibits a broad range of microbicidal activity against bacteria, fungi, protozoa, and viruses. Iodine is rapidly bactericidal, fungicidal, tuberculocidal, virucidal, and sporicidal. Although aqueous or alcoholic (tincture) solutions of iodine have been used for 150 years as antiseptics, they are associated with irritation and excessive staining.6,7

II. MATERIALS AND METHOD

We conducted prospective study of all suspected cases of bacteremia among inpatients above 15 years of age in our Rajarajeswari medical college & hospital a tertiary care centre, phlebotomy procedures to the collection of blood samples for culture was done collecting paired samples with single swab using IPA for 30 seconds and allow it to air dry. And in double swab combination PI for 60 seconds extra time given as duration of contact. --All blood sample were inoculated in brain heart infusion broth incubated at 37 degree and sub cultured every alternate days for 7 days. No growth was declared after 14 days.8,9

III. RESULTS

A total of 112 paired blood sample, yielded 91 (81.2%) no growth, 14 (12.5%) yielded bacterial growth, 7(6.25%) yielded
contaminants among all the samples which were collected in two different sites (right and left hand).

IV. CONCLUSION

The use of a single application of 70% IPA is sufficient and more clinically feasible to reduce contamination rates. In the current study, we have shown that the additional application of PI to 70% IPA has no change in contamination rates.10-11

V. REFERENCE


