

Achieving asepsis of banana leaves for the management of toxic epidermal necrolysis

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ABSTRACT

Background: Banana leaf is used in many centers in India during the care of patients with toxic epidermal necrolysis (TEN) and other extensive blistering disorders. Sepsis is an important cause of death in TEN patients and use of banana leaf may be a source of such infection. **Aims:** We conducted this study to detect the bacterial flora of the banana leaf and to examine various methods of rendering the leaf aseptic. **Methods:** Five pieces of banana leaf, 2 x 2 cm in size, were cultured separately in blood agar as follows: One piece was heated over a flame and one was soaked in boiling water and one was autoclaved. Methylated spirit was applied over one piece and ignited. One piece was placed on the media, 'as is.' The Petri dishes were incubated examined after 48 h. **Results:** All the pieces except the autoclaved specimen of the leaf grew coagulase-negative staphylococci (CONS) when aseptic precautions were not maintained and aerobic spore bearers when all aseptic measures were subsequently instituted during the procedure. **Conclusion:** We recommend measures to prevent possible transmission of bacterial infection by the leaf. Autoclaved and aseptically handled banana leaves may be used to reduce chance of infection in the treatment of TEN.

Key Words: Banana leaf, toxic epidermal necrolysis

INTRODUCTION

In India, some dermatologists use a banana leaf spread over the bed sheet for patients with toxic epidermal necrolysis (TEN) and pemphigus since the leaf does not adhere to the loose skin. Patients with TEN are often treated with a high dose of immunosuppressive drugs, thereby predisposing them to infection. Since many individuals handle a banana leaf before it is placed over the bed, the leaf may be contaminated. In addition, the leaf, like the skin, has resident flora.^[1] We conducted this study to detect the bacterial flora of the banana leaf. We also tried different methods to reduce the flora, thereby rendering the leaf suitable

for use over raw areas in an immunocompromised patient.

METHODS

Five pieces measuring 20 x 10 cm in size were cut from a single banana leaf. Initially, all pieces were handled with and without aseptic precaution as follows: One piece was gently heated directly over a flame of a Bunsen burner. Boiling water was poured over another piece for 5 min. A thin layer of methylated spirit was applied to the third piece using cotton wool and immediately ignited. The procedure was repeated twice on either side. The fourth piece

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was autoclaved at a pressure of 15 lbs/in² for 15 min at a temperature of 121°C.^[2]

A smaller piece 2 x 2 cm in size was cut from these four pieces of leaf and applied over blood agar media in a Petri dish, which was incubated for 48 h and then examined. The whole procedure was subsequently repeated in an aseptic setting.

The last piece was autoclaved and stored in a refrigerator at a temperature of 4°C. On day 7, the sterile wrapping was removed and the piece was cultured as described above.

RESULTS

All the leaves except the autoclaved one grew coagulase negative *Staphylococcus* (CONS) when aseptic measures were not adopted. When the procedure was repeated with aseptic precautions, all the leaves except the autoclaved specimen grew aerobic spore-bearing bacilli. The autoclaved specimen did not show growth when inoculated immediately following autoclaving and when inoculated after 7 days.

DISCUSSION

Semipermeable membranes are used for dressing extensive areas of the body following loss of skin due to burns.^[3] Loss of skin following burns, TEN or extensive vesicobullous eruptions makes the skin susceptible to secondary infection. In addition, patients with TEN and vesicobullous eruptions are often treated with high doses of systemic corticosteroids and other immunosuppressive drugs that can increase the chances of secondary infection.

Barrier nursing is recommended in the treatment of TEN and extensive burns. Although banana leaves are used in the management of TEN because of their nonadhesive property, their safety has not been properly studied. Leaves, like the human skin, have a resident flora.^[1] The organisms are usually not pathogenic but may become pathogenic in the immuno-compromised.^[4] The natural flora are known as phylloplane flora on the surface of the leaf and

rhizoplane flora on the surface of the roots.^[1] Bacterial flora of the aerial plant surface include Gram-negative rods such as *Erwina*, *Pseudomonas*, *Xanthomonas*; and fermentative Gram-positive bacteria such as *Lactobacillus*, *Streptococcus* and *Leukonostoc*.^[1] As the plant matures, both bacterial and fungal flora change.

We were able to demonstrate coagulase-negative *Staphylococcus* (CONS) and aerobic spore-bearing bacilli on leaf cultured 'as is' and following other measures described. Most leaves, especially banana leaves, have a tendency to tear along the venation, necessitating their frequent change, which in turn increases the possibility of secondary infection.

Drawing inspiration from the grandmothers and hoteliers in South India, we heated the leaf by different methods to make it more supple and resistant to shear and tear strain. The process of warming the leaf over the flame is practiced in a few centers in India (personal communication: Dr. Ashraf, Consultant Dermatologist, Kanur, Kerala). We were surprised that even these procedures did not effectively remove the resident flora or the organisms on the leaf, possibly transmitted by handling the leaf.

Autoclaving was the only effective method to ensure that the leaf was sterile before it was used on the denuded skin of the patient. Hence we recommend that it is desirable to use autoclaved leaves with all aseptic precautions. Since it would be difficult to sterilize the leaf each time, we suggest that multiple individually packed leaves be autoclaved and stored in a refrigerator for use as and when needed.

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