

Evaluation of bactericidal effect of three antiseptics on bacteria isolated from wounds

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ABSTRACT

FULL TEXT

REFERENCES

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Objective:

Antiseptics are widely used in wound management to prevent or treat wound infections due to their proven wound healing properties regardless of their cytotoxicity. The objective of this study was to determine the bactericidal effects of three antiseptics on pathogens known to cause wound infections.

Method:

The study was carried out at a tertiary care hospital and a university microbiology laboratory in Sri Lanka in 2013. The three acids (acetic acid, ascorbic acid and boric acid) in increasing concentration (0.5%, 0.75% and 1%) were tested against bacterial suspensions equivalent to 0.5 McFarland standard. The Bacteria isolates used were isolated from wound and standard strains of *Staphylococcus aureus*, *Escherichia coli* and *Pseudomonas aeruginosa*.

Results:

There were 33 (68.8%) Coliforms, 10 (20.8%) *Pseudomonas* species, and 5 (10.4%) strains of *Staphylococcus aureus*. Acetic acid at concentration of 0.5% inhibited growth of 37 (77%) and 42 (87.5%) of tested isolates when exposed for 30 and 60 minutes, respectively. However 100% inhibition was achieved at four hours. At a concentration of 0.75%, 40 (83.3%) and 44 (91.7%) were inhibited when exposed for 30 and 60 minutes, respectively, with 100% inhibition at 4 hours. At concentration of 1%, 46 (95.8%) inhibition was seen at 30 minutes and 100% inhibition at 60 minutes.

Ascorbic acid, at 0.5% and 0.75 % concentrations, inhibited growth of 45 (93.7%) and 47(97.9%) of isolates respectively when exposed for 30 minutes. At these two concentrations, 100% inhibition was achieved when exposed for one hour. At 1% concentration, 100% inhibition was achieved at 30 minutes. Boric acid did not show bactericidal effect at concentrations of 0.5%, 0.75 % and 1%. *Pseudomonas* species were inhibited at 30 minutes by 0.5% acetic acid. Bactericidal effect against all the standard strains was seen with three acids at each concentration tested from 30 minutes onwards

Conclusion:

Ascorbic acid was bactericidal for all organisms tested within the shortest exposure time at the lowest concentration compared to other two acids.

Despite promising bactericidal effects, further studies warrant, as ongoing debates on toxicity of acids on tissue epithelialisation.

Application of antiseptics for a shorter duration could overcome this problem without losing bactericidal activity.

Declaration of interest:

The authors have no conflict of interest and no funding was received for this study.

Keywords: bactericidal effect, antiseptics, wound care, ascorbic acid, acetic acid, boric acid, wound healing