

30% NaCl Solution as a Disinfecting Alternative for Surgery Equipment and Wound Care

Hogh, Signe (School: Egaa Gymnasium)

In many countries and war zones, disinfectant agents may be unavailable due to financial or other issues, causing general surgeries and simple wounds to pose potential death risks. The use of osmosis through high concentrations of NaCl has been applied to reduce bacterial growth in human wounds. Pilot studies performed at Egaa Gymnasium showed that a 30% NaCl solution for 30 minutes was as effective as a 20% soft potassium soap solution, whereas 10% and 20% NaCl solutions did not show any difference in killing *Bacillus subtilis* compared to PH neutral water. In this study, a 30% NaCl solution was used to quantify the antibacterial effect on *Bacillus subtilis* at 10, 20, and 30 minutes post application. Quantification was performed visually with the colony-forming-units method. At baseline, there were 10^9 colonies on the agar plates. The amount of colonies dropped to 10^7 after 10 minutes and to 10^6 after 20 minutes. Only a minor reduction in the number of colonies was seen at 30 minutes post application. The results showed that 20 minutes of exposure to 30% NaCl reduced the number of *Bacillus subtilis* colonies approximately 300 times. While the use of 30% NaCl is neither as quick nor as efficient as ethanol or potassium soap solution, it could serve as an alternative in situations when these are not available.