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Changes of pH and Pseudomonas Aeruginosa Growth in Liquid Media

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Abstract : Background: Wound pH affects a number of important factors in wound healing. We previously measured the pH value of the exudates collected from second-degree burns and found that the increase in pH was observed in the burn wounds in which colonized by Staphylococcus spp., and the increase in pH was evident prior to the clinical findings of local infection. To investigate the relationship between the changes of pH value and bacterial growth, we performed in vitro study using Pseudomonas aeruginosa and liquid medium as a locally infected wound equivalent model. Methods: Pseudomonas aeruginosa standard strain (ATCCR 10145TM) was cultured at 37 °C environment in Luria Broth Miller medium. The absorbance rate which means the amount of bacteria was measured by a microplate reader 2300EnSpireTM). The pH was measured using pH-indicator strips (MColorpHastTM). The statistical analysis was performed using the product-moment correlation coefficient of Pearson's. Results: The absorbance rate and pH value were increased along with culture period. There was a positive correlation between pH value and absorbance rate (n = 27, Pearson's r = 0.985). Moreover, there was a positive correlation between pH value and the culture period (n = 18, Pearson's r = 0.901). The bacteria was well growth in the media from pH 6.6 to pH 8.0 and the pH of culture media converged at 8 -9 along with the bacterial growth. Conclusion: From these results, we conclude that pH value of the wound is correlated with the number of viable bacteria and bacterial growth periods.

Keywords : colonization, potential of hydrogen, Pseudomonas aeruginosa, wound
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