Sodium bicarbonate and hydrogen peroxide: the effect on the growth of Streptococcus mutans.

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Abstract

PURPOSE:

This in vitro experiment studied the effects of sodium bicarbonate and hydrogen peroxide on the cariogenic bacteria Streptococcus mutans through analysis with a spectrophotometer.

METHODS:

The growth of S. mutans was analyzed using seven different environments. Twelve wells in each of the seven rows of a multi-well plate were used to incubate the test materials. In combinations of 10 microl distilled water, 100 microl broth, 10 microl 10% sucrose, 10 microl S. mutans, 10 microl 10% sodium bicarbonate, and 10 microl 3% hydrogen peroxide, seven different environments were created for testing. Environments had either sodium bicarbonate or hydrogen peroxide with S. mutans, or a combination of sodium bicarbonate and hydrogen peroxide with S. mutans. The plate was incubated at 37 degrees C and measured at 0, 18, 20, 22, 24, 26, 28, 30, and 42 hours by optical density with a spectrophotometer.

RESULTS:

Results showed bacterial growth was prevented by sodium bicarbonate, hydrogen peroxide, and the combination of sodium bicarbonate and hydrogen peroxide. Although hydrogen peroxide is bacteriocidal and sodium bicarbonate is bacteriostatic, there were no significant differences among the three treatment groups in spectrophotometer readings at any of the nine readings over 42 hours.

CONCLUSION:

There was no significant difference among the effects of hydrogen peroxide, sodium bicarbonate, or the sodium bicarbonate and hydrogen peroxide combination, as measured by optical density. The hydrogen peroxide, sodium bicarbonate, and the sodium bicarbonate and hydrogen peroxide combination prevented bacterial growth of S. mutans. The results show that products containing these agents have the ability to stop the growth of S. mutans. Products containing sodium bicarbonate and/or hydrogen peroxide may be useful to caries-prone patients. More studies are needed to confirm these results on patients.