Chlorine Dioxide ClO₂ /Phosphate Germicide vs. Actinobacillus actinomycetemcomitans (Aa) and Prophromonas (P). (Bacteroides) Gingivalis

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The purpose of this study was to determine the bactericidal effectiveness of ClO₂/ phosphate solutions against Aa and P. gingivalis.

Method: Using standard anaerobic culture techniques the percentage kill rate of Aa. and P. gingivalis against a ClO₂/ phosphate solution were recorded.

Results: Aa. was killed in 10 seconds by 0.1% ClO₂, pH 6.5, without serum at 99% and with serum at 99%. P. gingivalis was killed in 10 seconds without serum at 99%, but with serum at 82%.

Conclusion: We conclude that ClO₂/phosphate solutions at 0.1% chlorine dioxide concentration, pH 6.5, was an effective germicide against both organisms tested.

Use of an oxidising agent to destroy amino acids to prevent their use as building blocks for protein

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Bacteria use amino acids to synthesise proteins. If available amino acids were reduced or eliminated, there should be a reduction in the ability for micro organisms to multiply in body cavities.

Method: 17 essential and non-essential amino acids, in the absence of their transaminases, were placed in 4 vials with verified concentrations of each amino acid (baseline). 0.01% chlorine dioxide solution was added to 3 vials. The forth vial was kept as a control. At the end of 1, 3, and 5 minutes all vials were assayed by iodometric methods after removal of residual chlorine dioxide by thiosulfate. Evaluation of each was by high performance liquid chromatography.

Results: After 5 minutes at baseline the percentage changes of decrease in amino acids were:

- Arginin: 35.57%
- Histidine: 49.68%
- Isolecine: 36.80%
- Leucine: 21.93%
- Lysine: 33.33%
- Methionine: 70.91%
- Phenylalanine: 35.10%
- Threonine: 26.23%
- Valine: 37.50%
- Alanine: 23.49%
- Aspartic Acid: 12.08%
- Cysteine: 99.19%
- Glutamic Acid: 10.69%
- Glycine: 67.94%
- Proline: 6.78%
- Serine: 44.18%
- Tyrosine: 27.44%

Conclusion: In the absence of transaminases a 0.01% solution of chlorine dioxide is a partially effective agent to de-activate all amino acids within 5 minutes using this procedure.