

**Zinc Gluconate and the Common Cold  
A Controlled Clinical Study. The Journal of International Medical Research,  
Volume 20, number 3, June 1992. J C Godfrey, B Conant Sloane, D S Smith,  
J H Turco, N Mercer and N J Godfrey.**

A report in 1984 on the success of zinc gluconate against common cold symptoms could not be confirmed in three subsequent studies, which are now known to have used formulations that inactivated zinc. A non-chelating formulation including Glycine, which releases 93% of contained zinc into saliva, was tested in a randomized, placebo-controlled, double-blind trial in 73 young adults. Efficacy was recorded in symptom diaries using a symptom severity rating. Patients' symptoms first appeared 1.34 days prior to entry into the study in both groups. Disappearance of symptoms occurred after an additional 4.3 days for zinc-treated patients versus 6.1 days for placebo-treated patients. A difference was noted in the efficacy of treatment if it was started 1 day after symptom onset. Cold duration was an additional 4.3 days in zinc-treated patients compared with 9.2 days for placebo-treated patients. Cough, nasal drainage and congestion were the symptoms most affected, and only mild side effects were noted.

**Zinc(II) in Saliva:** Determination of Concentrations Produced by Different Formulations of Zinc Gluconate Lozenges Containing Common Excipients. Journal of Pharmaceutical Sciences, Volume 81, Number 2, February, 1992. John E. Zarembo, John C. Godfrey and Nancy Jane Godfrey

A study of the pH of saliva produced by humans sucking hard candy lozenges containing zinc gluconate and citric acid demonstrated the probability that the formulation delivered an insignificant amount of the contained zinc as  $Zn(2)^+$ . This could account for the negative results of several clinical studies of this lozenge and similar formulations as treatment for the common cold. Direct measurement of unbound  $Zn(2)^+$  in saliva from this and other zinc gluconate formulations was required to substantiate the inference from the pH study. A specific-ion electrode assay method was developed. Using this method, it was found that saliva completely suppresses the ionization of zinc to free  $Zn(2)^+$  in the presence of citric acid or a 30-fold Molar excess of mannitol plus sorbitol. Under the same conditions, however, the presence of an excess of glycine does not interfere with ionization to produce  $Zn(2)^+$ . This finding supports the hypothesis that the positive clinical results of three studies were due to the use of formulations which release ionic zinc.