

EFFECT OF PHYSICO-CHEMICAL NATURE OF SUSPENDING AGENTS ON NEUTRALIZATION CAPACITY OF ALUMINA AND MAGNESIA SUSPENSION

Z. H. Patel ¹, N. K. Patel ¹

¹ Long Island University, NY

Purpose. To study the effect of anionic and nonionic suspending agents on in vitro neutralization capacity (NC) of antacid suspensions.

Method. Using Silverson L4R homogenizer one L batch containing 200 mg each of aluminum hydroxide and magnesium hydroxide per 5 mL was prepared. Included were also sorbitol, 7% or potassium citrate, 0.6%; methylparaben, 0.2%; propylparaben, 0.02%; peppermint oil, 0.005% and hydroxypropyl cellulose (Nisso HPC) or Na carboxymethylcellulose (Hercules CMC) or Na alginate, 1%. Fordtran's in vitro pH-stat neutralization method was used (Fordtran, J.S. et al, New Engl.J.Med.,288,1973). One mL the suspension was added to 100 mL of water at 37°C and stirred at 60 rpm using 2.5 cm magnetic bar and titrated with 0.1N HCl to maintain pH 3 at intervals of 5 min for 1 hour and 10 min during 2nd hour.

Result. The in vitro method correlates with in vivo antacid activity (Simmons,D.,Patel,N.K. et al, Drug Dev. Ind. Pharm., 7, 621, 1981.). NC has been expressed as mEq HCl / 5 mL dose of antacid. These values at 60 min for HPC/sorbitol, NaCMC/sorbitol (Fig.1) and Na alginate /sorbitol (Fig.2) were 11.3, 6.8 and 2.7 mEq respectively. At 120 min, they were 12.5 and 7.5 mEq for HPC and NaCMC respectively (Fig.1). Nonionic HPC showed higher activity over NaCMC or Na alginate. Negatively charged CMC and alginate plausibly coats the colloidal aluminum hydroxide. Addition of HCl (proton) neutralize the negative charge resulting into insoluble matrix entrapping the antacid. Na alginate forms a tougher matrix than CMC yielding its lower NC. Inclusion of neutral HPC in the antacid resulted in its higher activity. The data also showed that potassium citrate was better than sorbitol in increasing the NC of NaCMC containing antacid.

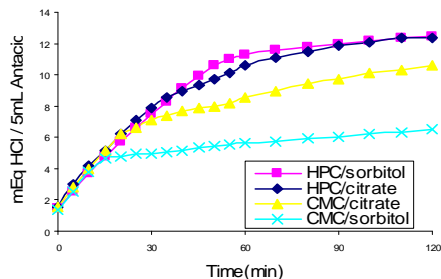


Fig.1 NC of antacid with HPC and NaCMC

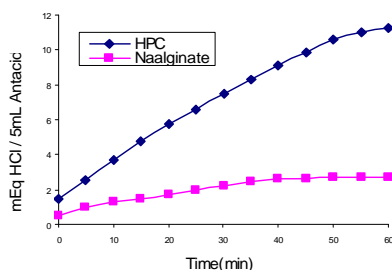


Fig.2 NC of antacid with HPC and Na alginate

Conclusion. The NC of antacid suspension was significantly reduced by anionic suspending agent, NaCMC and Na alginate. Nonionic HPC showed the highest activity among the suspending agents studied.

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