Nanoparticles Formulation from Chitosan and Sodium Tripolyphospate by Ionic Gelation method using verapamil Hydrochloride as drug model (poster on 24th FAPA Congress 2012 Culture Medicine: Bringing Traditional Medicine to Modern Life)

Raditya Iswandana, author

Abstrak

Nanoparticles is one type of drug delivery system which intended to improve the bioavailability of drugs. Nanoparticles can be prepared by several methods and the ionic gelation method is the easiest one. Verapamilhydrochloride is adrugwhich used asantiarrhythmic,antiangina, and antihypertension therapy. Nevertheless, bioavailability of orally administered verapamil is very low, only about 10 to 23%. Therefore, verapamil hydrochloride was prepared as nanoparticlesdosage form to increase its bioavailability. The purpose of the present study was to optimize ionic gelation method of chitosan and sodium tripolyphosphate to obtain thebest nanoparticles formulation. Nanoparticles were obtained from four different methods. Formula A, B and C were produced by drop the sodium tripolyphosphate solution into chitosan solution at 0.75 mL/minute, while formula D were prepared by pour sodium tripolyphosphate solution into chitosan solution. Formula A and B were then strired at 400 rpm, while formula C and D at 3000 rpm. Three grams of verapamil hydrochloride was added into formula A, while formula B, C, and D were produced by adding 5 grams of verapamil hydrocloride. Particle size distribution, zeta potential, entrapment efficiency, morphology, and fourier transform infra red spectrum of each nanoparticles formula were characterized. The chosen formula was formula D which has 62.8 nm of size, 59.15% of entrapment efficiency, +25.46 mV of zeta potential, spherical shape, and the ionic interaction was confirmed by FT-IR spectrum. The results showed that chitosan-tripolyphosphate succesfully produce the verapamil hydrochloride nanoparticles by ionic gelation method.