Dry powder coated osmotic drug delivery system

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Dry powder coated osmotic drug delivery system

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Abstract: Dry powder coated osmotic drug delivery system (ODDS) were prepared and characterized using an innovative powder coating technology. Coating powder adhesion to the surface of the ODDS core was firstly performed through an electrostatic spray gun, followed by a curing step to allow those electrically deposited particles coalesce and form a continuous, uniform and strong coating film, which is the semipermeable membrane of the ODDS. Triethyl citrate (TEC) was found to be a better liquid plasticizer than PEG 400 both in reducing the glass transition temperature of the coating polymer (cellulose acetate) and in increasing the electrical conductivity of the ODDS cores, both of which led to an enhanced coating powder adhesion and film formation. Results of SEM indicated that the uniformity of the coating film varied significantly with the difference of curing time and temperature. Salbutamol sulfate and ibuprofen were used as the model drugs. Release profiles of both showed that zero-order drug release kinetics was achieved. Release rate of both drugs from powder coated ODDS could be adjusted by changing the coating level but was independent of the agitation speed and of the pH of the release media.

Keywords: Osmotic drug delivery system; dry powder coating; electrostatic coating; liquid plasticizers; controlled drug release

1. Introduction

Conventional delivery cannot control drug release rate, which needs multiple