



Title Development of effervescent floating capsules for gastroretentive drug delivery systems

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The effervescent floating capsule was developed. Theophylline was used as a model drug. The system consists of drug-containing core capsule and fillers which coated with effervescent layer (sodium bicarbonate) (in case no effervescent in core capsule) and gas-entrapped membrane, respectively. According to preliminary study, the suitable filler in core capsule is HPMC, a good swelling and gel forming polymer. The formulation using HPMC as a filler showed better floating abilities and drug release than that using spray dried lactose or MCC as a filler. The effects of formulation variables such as excipient or filler in core capsule, amount of effervescent agent, type of polymers and polymer ratio in gas-entrapped membrane, gas-entrapped membrane level, effervescent addition method on floating abilities and drug release were investigated. For floating abilities, all formulations floated immediately and some formulations could maintain buoyancy longer than 8 hours. The floating capsules containing higher molecular weight HPMC as a filler showed slower drug release than those containing low molecular weight HPMC because of its higher viscosity, higher swelling and lower erosion. The drug release tended to increase with increasing amount of gas forming agent and decreasing coating level of gas-entrapped membrane. However, these variables did not show significant effect. The floating capsules using Eudragit<sup>®</sup> RL30D as a gas-entrapped membrane showed faster drug release than that using Eudragit<sup>®</sup> RS30D as a gas-entrapped membrane and decreasing ratio of Eudragit<sup>®</sup> RL30D in gas-entrapped membrane of the floating tablets retarded drug release. The floating capsules with effervescent layer showed slower drug release than that with effervescent containing core capsule. According to these results, floating abilities and drug release of the floating capsules could be modified by formulation variables and good floating ability (immediate floating, floating time more than 8 hours) with sustained release floating tablets was achieved in the optimized formulation in this study. The floating capsule developed in this study is promising as a carrier for gastroretentive DDS.