ABSTRACT

Targeted drug delivery is attracting more attention for its significant importance, patient comfort and cost effective treatment. Targeted drug delivery is best way to give drugs to patients as it avoids excess dose which results to avoid or reduce toxicity and taking repeated medicines. Aminoglycoside category drug (Gentamicin Sulphate) was selected, which is a broad spectrum antibiotic. Gentamicin sulphate is having adverse effects like ototoxicity and nephrotoxicity when administered over a period of time. In wound care there is a scope to deliver antibiotic drug at wound site to avoid infections and for better patient comfort. In present study we have designed, prepared and characterized an antibiotic drug (gentamicin sulphate) loaded biodegradable blend. The selection and composition of excipient is unique.

All excipients and drug was studied for their compatibility with each other. Solvent casting method of implant preparation was adopted as it is easy and which has given better yield. Formulation process was optimized by in process testing. This blend was then molded as a film by using glass plate.

We have studied the drug release profile, degradation behavior of PLGA up to 42 days with defined time interval. In vitro release test (IVRT) study was performed using saline phosphate buffer solution of pH 7.20 ±0.05 as receptor media and at 37°C ± 1°C with mechanical shaking. Drug release in IVRT was studied by UV absorbance of receptor solution. Physical characterization of polymer was done by gel permeation chromatography (GPC) and texture was observed on scanning electron microscope (SEM). It was observed that about 3.5µg/gm/hr drug was releasing. Also there was a molecular weight loss of PLGA and change in texture observed in SEM. Obtained results demonstrates that implant was releasing drug and degrading simultaneously. This released drug concentration was analyzed and reported. Average 3.5 microgram of drug was released per gram per hour of implant which is equivalent to minimum inhibitory concentration of Gentamicin.

Keywords: Biodegradable, Antibiotic, Gentamicin, Implant, Drug Delivery, Degradation.