Development and characterization of cisplatin and probiotic loaded suppositories for the management of cervical cancer

Amandeep Singh

Department of Pharmaceutics, ISF College of Pharmacy, Moga, 142001, Punjab, India

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ABSTRACT

Introduction: The work presented here showed the combined effects of an anticancer drug, cisplatin, along with probiotics(Lactobacillus rhamnosus) to circumvent the side effects associated with chemotherapy and to enhance the therapeutic effect. **Materials and Methods:** Suppositories with drug and probiotic were prepared by melt mold method using the blend of PEGs. The suppositories were characterized for various parameters. % Cell viability was performed by MTT assay. **Results:** and Discussion The free radical scavenging activity of Lactobacillus rhamnosus by NO assay was observed to be 60.77 µg/mL. The mean weight variation, melting time, content uniformity, friability and hardness of the prepared suppositories were 1.25± 0.025mg, 10.86 ± 0.64 min, 99.89±0.74, 0.25%, 2.2 kg/cm2. The release kinetics followed Peppas model. MTT assay presented that the formulation showed higher cytotoxicity when compared with plain cisplatin. Tumour regression displayed that formulation caused notable reduction in tumour volume. Histopathology studies demonstrated that the developed formulation is safe for local delivery of cisplatin. The cytotoxic action of the drug and probiotic-loaded formulation is quite high, which could be due to the antitumor effect of the probiotics. Biosurfactants released from the probiotic biomass might help in increasing the permeability and can result in an enhancement in in-vitro antitumour activity. **Conclusion:** This study provides the basis for a combination of local delivery approach along with the beneficial effects of a probiotic strain, which could help to resolve the problems caused by traditional chemotherapy.

Keywords: Probiotics, cisplatin, suppositories, local delivery, chemotherapy