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Formulation and characterization of dacarbazine loaded stearic acid nanoparticle cream and its cytotoxic potential

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In current years, rapid increase in the number of skin cancer patients has led to socio-economic burden worldwide. Dacarbazine (DZ) is a single drug approved by US-FDA for the treatment of a type of skin cancer melanoma. DZ have short half-life in systemic circulation as well as poor water solubility, slow response rate with severe toxicity which limits its market potential. In view of the above background present study is designed for formulation, characterization and pharmacological evaluation of dacarbazine laden nanocream (DZC) for the treatment of melanoma. Dacarbazine loaded stearic acid nanoparticles (DZP) prepared by diffusion method. DZC prepared by oil-in-water emulsion technique by using DZP. Dacarbazine nanoparticle and its cream were characterized for shape size of particle, drug loading capacity, nanoencapsulation efficacy, zeta potential, transmission electron microscopy (TEM), pH value, spreadability and viscosity, *in vitro* drug releasing capacity and its cytotoxic effect by using MTT assay. The particle size of DZNP and DZNC was 16.3 ± 8.1 nm and 16.9 ± 7.8 nm respectively. pH value and spreadability of nanoparticle cream were found to be 6.7 ± 0.14 g cm/sec and 55.23 ± 3.13 g cm/sec respectively. Nanoencapsulation efficiency and drug loading capacity were $67.4 \pm 3.5\%$ and 6.73 mg/10 mg respectively. From above results, it can be concluded that DZC can be effectively utilized for the treatment of melanoma.

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