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Dendrimer-based drug delivery system- focus on Indian visceral leishmaniasis

Pradeep Kumar

Amity University Rajasthan, India

Leishmaniasis: a vector-borne disease has a worldwide existence. It presents mainly in four forms: visceral leishmaniasis, cutaneous leishmaniasis, mucocutaneous leishmaniasis and post kala-azar dermal leishmaniasis (PKDL). In India, visceral leishmaniasis is the most existence type of leishmaniasis. Visceral leishmaniasis is also known as kala-azar, black fever, dum dum fever, burdwan fever, sarkari bimari etc. Visceral leishmaniasis is caused by Protozoa species haemoflagellate *Leishmaniasis donovani* and transmitted by the bite of sand flies of *Phlebotomus* genus. Visceral leishmaniasis affects various age groups. Approximately, 10 k morbidity with 1 k mortality occurs annually due to visceral leishmaniasis in India. Fast urbanization, poverty, improper sanitation, lack of knowledge about prevention and individual risk factors like HIV, malnutrition and genetic susceptibility is the major source of visceral leishmaniasis existence in India. Approximately, 90% cases of Indian visceral leishmaniasis come from Bihar. Available treatment modalities have limitations like serious side effects, nonoral solubility, high cost and long hospitalization, due to this, a favorable treatment option for visceral leishmaniasis is still out of range of a common man. A dendrimer is a new generation of artificial polymeric macromolecules constructed in a step-by-step fashion using repetitive chemistry. Dendrimer has a number of applications in several pharmaceutical fields such as enhancing the solubility of the poorly soluble drug, enhancing the delivery of DNA, and as a carrier for the development of novel drug delivery systems. The present research emphasizes the development of a conjugate of dendrimer with the nonoral soluble drug for the purpose of oral solubility enhancement and then use for the treatment of visceral leishmaniasis.

Pradeepkalgar@gmail.com

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