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Effect of topical liposomes containing paromomycin sulfate in the course of Leishmania major infection in susceptible BALB/c mice

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View references (٥٠)

Abstract

The aim of this study was to evaluate the antileishmanial effects of topical liposomal paromomycin sulfate (PM) in Leishmania major-infected BALB/c mice. Liposomes containing ١٠ or ١٥٪ PM (Lip-PM-١٠ and Lip-PM-١٥, respectively) were prepared by the fusion method and were characterized for their size and encapsulation efficiency. The penetration of PM from the liposomal PM formulations (LPMFs) through and into skin was evaluated in vitro with Franz diffusion cells fitted with mouse skin at ٣٧°C for ٨ h. The in vitro permeation data showed that almost ١٥٪ of the LPMFs applied penetrated the mouse skin, and the amount retained in the skin was about ٦٠٪ for both formulations. The ٥٠٪ effective doses of Lip-PM-١٠ and Lip-PM-١٥ against L. major promastigotes in culture were ٦٥,٣٢ and ٥٩,٧٣ μg/ml, respectively, and those against L. major amastigotes in macrophages were ٢٤,٦٤ and ٢٦,٤٤ μg/ml, respectively. Lip-PM-١٠ or Lip-PM-١٥ was used topically twice a day for ٤ weeks to treat L. major lesions on BALB/c mice, and the results showed a significantly ($P < ٠,٠٠١$) smaller lesion size in the mice in the treated groups than in the mice in the control group, which received either empty liposomes or phosphate-buffered saline (PBS). Eight weeks after the beginning of the treatment, every mouse treated with LPMFs was completely cured. The spleen parasite burden was significantly ($P < ٠,٠٠١$) lower in mice treated with Lip-PM-١٠ or Lip-PM-١٥ than in mice treated with PBS or control liposomes, but no significant difference was seen between the two groups treated with either Lip-PM-١٠ or Lip-PM-١٥. The results suggest that topical liposomal PM may be useful for the treatment of cutaneous leishmaniasis.

Reaxys Database Information

Indexed Keywords

EMTREE drug terms: liposome; paromomycin

EMTREE medical terms: amastigote; animal experiment; animal model; animal tissue; article; Bagg albino mouse; controlled study; female; Leishmania major; microencapsulation; mouse; nonhuman; particle size; priority journal; promastigote; skin leishmaniasis

MeSH: Administration, Cutaneous; Animals; Cell Line; Diffusion; Female; Leishmania major; Leishmaniasis, Cutaneous; Liposomes; Mice; Mice, Inbred BALB C; Paromomycin; Particle Size; Skin; Spleen

Medline is the source for the MeSH terms of this document.

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