NEW EFFECTIVE SINGLE-DOSE TREATMENT OF CUTANEOUS LEISHMANIASIS

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Keywords: Cutaneous Leishmaniasis; Chemotherapy; Microparticles

Abstract

Conventional leishmaniasis treatment is given by systemic routes, producing severe generalized toxicity which is particularly unacceptable in the case of localized cutaneous leishmaniasis (CL). Consequently, new drugs and appropriate delivery systems are required. In this context, here, we proposed to develop a single-dose local treatment of CL, based on PLGA microparticles implant. For that, PLGA (poly lactide-co-glycolide acid) microparticles with varying polymeric matrixes were prepared by spray drying technique. Two formulations (18%CH8-PLGA and 18%CH8-PLGA-PVP) were produced with high drug loading (18% CH8), round smooth surface, 8 µM mean diameter, and packed with CH8 crystals in the inner core as seen by RAMAN microscopy. These were tested for efficacy against CL in *L. amazonensis* GFP-infected BALB/c mice. After 7 days of infection in the ear, the animals were given a single intralesional injection of 18%CH8-PLGA or 18%CH8-PLGA-PVP at a dose of 30 µg of CH8. Controls received the same dose of free CH8 or 10 µL of PBS alone. On days 30 or 60 of infection, animals we sacrificed, the ears removed, grinded and assayed by fluorometry for instant determination of parasite loads. We found that all CH8 formulations were effective in controlling parasite growth. 18%CH8-PLGA-PVP promoted the most effective and long-lasting parasite growth control, reducing parasite loads by 98% as compared with 79% of free CH8. These findings show that the PLGA-based implant was successfully produced by spray-drying technique, and addition of polyvinylpyrrolidone PVP onto the polymeric matrix allowing an effective and secure single-dose local treatment of CL.