Morphometric and histopathologic changes in skeletal muscle induced for injectable PLGA microparticles [Cambios morfométricos e histopatológicos en el músculo esquelético inducidos por microparticulas de PLGA inyectables]

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The administration of microencapsulated drug in a matrix acid poly(lactic-co-glycolic acid) (PLGA) by intramuscular (IM) in humans has been approved by the FDA for various applications though it is not clear what effect they have on the morphological parameters of muscle tissue. The aim of this study was to analyze the morphological changes in the skeletal muscle tissue with their use. We used 12 adult female Sprague Dawley rats (Rattus novergicus) that were injected into their right gastrocnemius muscle belly with: sterile vehicle solution (G1, n = 4), 0.5 mg PLGA microparticle (G2, n = 4) and 0.75 mg PLGA microparticle (G3, n = 4), both dissolved in a sterile vehicle solution. At 14 days post injection the number and diameter of muscle fibers, the level of inflammation and histology appearance in terms of organization of muscle fibers, cellular distribution, tissue morphology and the presence of polymer waste were determined and the results between the groups compared. The administration of the compound in a single dose did not alter the morphometric parameters (number and diameter of muscle fibers) despite generating a mild inflammation in the tissue associated with the presence of polymeric residues, suggesting that the PLGA microparticles were well tolerated by the muscle tissue at concentrations tested (0.5 and 0.75 mg).

Drug delivery

PLGA

Polymeric microparticles

Skeletal muscle