Nanomedicine. 2014 May;10(4):745-54

Safety of the intravenous administration of neurotensin-polyplex nanoparticles in BALB/c mice.

Hernandez ME, Rembao JD, Hernandez-Baltazar D, Castillo-Rodriguez RA, Tellez-Lopez VM, Flores-Martinez YM, Orozco-Barrios CE, Rubio HA, Sánchez-García A, Ayala-Davila J, Arango-Rodriguez ML, Pavón L, Mejia-Castillo T, Forgez P, Martinez-Fong D.

Abstract

Neurotensin (NTS)-polyplex is a gene nanocarrier that has potential nanomedicine-based applications for the treatment of Parkinson's disease and cancers of cells expressing NTS receptor type 1. We assessed the acute inflammatory response to NTS-polyplex carrying a reporter gene in BALB/c mice. The intravenous injection of NTS-polyplex caused the specific expression of the reporter gene in gastrointestinal cells. Six hours after an intravenous injection of propidium iodide labeled-NTS-polyplex, fluorescent spots were located in the cells of the organs with a mononuclear phagocyte system, suggesting NTS-polyplex clearance. In contrast to lipopolysaccharide and carbon tetrachloride, NTS-polyplex did not increase the serum levels of tumor necrosis factor alpha, interleukin (IL)-1β, IL-6, bilirubin, aspartate transaminase, and alanine transaminase. NTS-polyplex increased the levels of serum amyloid A and alkaline phosphatase, but these levels normalized after 24 h. Compared to carrageenan, the local injection of NTS-polyplex did not produce inflammation. Our results support the safety of NTS-polyplex.

FROM THE CLINICAL EDITOR:

This study focuses on the safety of neurotensin (NTS)-polyplex, a gene nanocarrier that has potential in the treatment of Parkinson's disease and cancers of cells expressing NTS receptor type 1. NTS polyplex demonstrates a better safety profile compared with carrageenan, lipopolysaccharide, and carbon tetrachloride in a murine model.