

Original Paper

Synthesis and anti-intracellular Copper overload evaluation of Nanoconjugated D-penicillamine –Dendrimer in Wilson’s model cells

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Abstract

Background and Objective: Wilson’s disease (WD) is caused by mutation to the cooer-transporting gene ATP7B. Chelation therapy is the main protochol of treatment for patients with Wilson’s disease. D-penicillamine is one of the well-known chelator agants which is used in WD treatment but it can not enter into the intracellular space.This study was done to evaluate the synthesis and anti-intracellular Copper overload evaluation of Nanoconjugated D-penicillamine –Dendrimer in Wilson’s model cells.

Methods: In this descriptive-analytic study, initially 0.01 mm polyethylene glycol (PEG) and 0.0018 mm citric acid, Dendrimer was synthesized. After purification by dialysis bag and lyophilization, 10mg dendrimer was conjugated to 3.3mg D-penicillamine. Nanoconjugated D-penicillamine-dendrimer was injected on Wilson’s model cells. After incubation and centrifugation intracellular measurement of copper concentration and FTIR test were done.

Results: Copper accumulation significantly reduced in the HepG2 WD cell by Nanoconjugated D-penicillamine - Dendrimer in compared to D-penicillamine (P<0.05). Copper accumulation was determined to be 46.61. MTT assay showed no toxicological damage in HepG2 WD cell.

Conclusion: Nanoconjugated D-penicillamine –Dendrimer can reduces intracellular concentration of Copper.

Keywords: Wilson’s Disease, Nanoconjugated D-penicillamine-dendrimer

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