عنوان مقاله:

Synthesises, characterization and Comparative study of bone regeneration on nano hydroxyapatite and hydroxyapatite/chitosan nanocomposite in rat

محل انتشار:

هجدهمین کنفرانس مهندسی پزشکی ایران (سال: 1390)

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خلاصه مقاله:

The bone matrix has two major phases at the nanoscale level containing of organic (collagen) andinorganic (Hydroxyapatite (HAp)). Incorporation of Hydroxyapatite with organic polymer in favor ofcomposites would be used in biomaterial engineering. In this research, nano-HAp and HAp/CTS nanocomposite were prepared via in situ Hybridization route and then studied for bone regeneration in 3 groups consist of pure HAp, HAp/CTS nanocomposite and control group in the rat calvaria after 7, 30 and 60 days. Crystalnanostructure and phase present of products were investigated by X-ray diffraction (XRD) and FTIRspectrum, respectively. Morphology of the samples were observed by scanning electron microscopy(SEM). The results confirmed homogeneity interaction between HAp and CTS matrix. It can beseen by increasing chitosan, the expected compatibility among HAp and matrix improving.XRD results indicated that the approximate crystallite sizes of products is found to be about16nm for pure HAp and 12nm for nanocomposite. in vivo investigation in rat calvaria showed thatnew bone regeneration area is 57.26% for HAp, 50.84% for HAp/CTS nanocomposite, and 5.64%for the control group after 60 days. Result obtained from in vivo tests confirmed feasibility of thesynthesized products as a temporary of bone substitute.

کلمات کلیدی:

Hydroxyapatite/Chitosan nanocomposite, biomaterial engineering,bioactivity, rat calvaria, bone regeneration