

MELANOMA AND MELANOCYTIC NAEVI

EFFECT OF HYDROXYAPATITE NANOPARTICLES ON HUMAN MELANOMA CELLS IN VITRO AND IN VIVO

Zhongtao Li⁽¹⁾ - Lin Wang⁽¹⁾

Department Of Dermatovenereology, West China Hospital, Sichuan University, Chengdu, China⁽¹⁾

Background: Hydroxyapatite ($\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$, HA), due to its excellent biocompatibility and bioactivity, has been widely used as drug carriers and scaffold materials in the clinic of dental, orthopedic and maxillofacial applications. Recent studies found hydroxyapatite nanoparticles (nHAP) have an antitumor effect on human gastric cancer MGc80-3 cells, osteosarcoma Os-732 cells and esophageal Ec-109 cells. Cutaneous malignant melanoma (CMM) is considered one of the most aggressive and lethal malignancies because of its high recurrence rate after surgical resection, propensity to metastasize and resistance to cytotoxic agents. Therefore, a search for new and adjunctive therapeutic approaches is necessary.

Objective: To indentify the effect of nHAP on human melanoma A375 cells in vitro and in vivo.

Materials and methods: We investigated anti-proliferation and anti-migration effects of nHAP on human melanoma cell lines A375 using cell counting kit-8 assay, transwell test and cell scratch assay. We also evaluated the anti-cancer effect of nHAP on CMM by establishing a model of xenograft subcutaneous human melanoma cells (A375) with or without 25mg/kg nHAP in balb/c nude mice (4 weeks old, female, $18.57 \pm 0.79\text{g}$) and observed the tumor growth.

Results: Results showed nHAP at the concentrations of 60 $\mu\text{g/ml}$, 120 $\mu\text{g/ml}$, 240 $\mu\text{g/ml}$ and 480 $\mu\text{g/ml}$ inhibited the growth and migration distance of A375 cells in a dose-dependent manner. After treated with 0 $\mu\text{g/ml}$, 240 $\mu\text{g/ml}$ nHAP for 24 hours, the number of A375 cells on basement membrane decreased from 3061 ± 372.05 to 341 ± 37.53 . After observing the tumor volume for 23 days, the average growth of the xenograft tumors injected with nHAP was significantly inhibited relative to that of the control, with the inhibition rate of 85.55%.

Conclusions: nHAP might inhibit proliferation and migration ability of human melanoma A375 cells in vitro and also inhibit the growth of xenograft melanoma.