In vitro effects and localisation of the photosensitizers m-THPC and m-PHPC MD on carcinoma cells of the human breast (MCF-7) and Chinese hamster fibroblasts (V-79)

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Background and Objective

Photodynamic therapy (PDT) is the combination of a photosensitizer with laser light to induce preferential destruction of malignant cells. In this study two new photosensitizers—5,10,15,20-meta-tetra (hydroxyphenyl) chlorin (m-THPC) and m-THPC MethoxyPEG2000 derivative (m-THPC MD)—were tested, both for their dark toxicity, i.e., cytotoxicity in the absence of light, and for their light-induced cytotoxicity in mammalian cell cultures.

Study Design/Material and Methods: Cell lines used were MCF-7 (human breast carcinoma) and V-79 (Chinese hamster lung fibroblast). After cultivation under standard conditions, cells were administered the photosensitizers and 24 hr later exposed to various energy levels of laser light at a wavelength of 652 nm. Cell survival was monitored using a clonogenic assay and was expressed as the surviving fraction of the untreated control.

Results

Up to an m-THPC concentration of 1 μ/ml, no dark toxicity was observed; at higher concentrations a rapid fall in survival occurred. m-THPC MD showed no dark toxicity up to 100 μg/ml. In vitro m-THPC was ~10 times more cytotoxic than m-THPC MD. The MCF-7 and V-79 cell lines displayed similar responses to PDT.

Conclusions

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