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In vivo fluorescence kinetics and photodynamic therapy using 5-aminolaevulinic acid-induced porphyrin: increased damage after multiple irradiations.

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Abstract

The kinetics of fluorescence in tumour (TT) and subcutaneous tissue (ST) and the vascular effects of photodynamic therapy (PDT) were studied using protoporphyrin IX (PpIX), endogenously generated after i.v. administration of 100 and 200 mg kg-1 5-aminolaevulinic acid (ALA). The experimental model was a rat skinfold observation chamber containing a thin layer of ST in which a small syngeneic mammary tumour grows in a sheet-like fashion. Maximum TT and ST fluorescence following 200 mg kg-1 ALA was twice the value after 100 mg kg-1 ALA, but the initial increase with time was the same for the two doses in both TT and ST. The fluorescence increase in ST was slower and the maximum fluorescence was less and appeared later than in TT. Photodynamic therapy was applied using green argon laser light (514.5 nm, 100 J cm-2). Three groups received a single light treatment at different intervals after administration of 100 or 200 mg kg-1 ALA. In these groups no correlation was found between the fluorescence intensities and the vascular damage following PDT. A fourth group was treated twice and before the second light treatment some fluorescence had reappeared after photobleaching due to the first treatment. Only with the double light treatment was lasting TT necrosis achieved, and for the first time with any photosensitiser in this model this was accomplished without complete ST necrosis.

Full text

Selected References

These references are in PubMed. This may not be the complete list of references from this article.

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