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984 – Photodynamic therapy for cutaneous recurrence of breast cancer: a potential palliative alternative

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Cutaneous recurrence of breast cancer represents a clinically challenging condition, frequently associated with pain, ulceration, bleeding, and reduced quality of life, particularly in advanced stages when effective local treatment options are limited. In this context, minimally invasive therapies capable of achieving local tumor control are highly desirable for palliative management. Photodynamic therapy (PDT) has emerged as a promising strategy due to its localized cytotoxic effects mediated by reactive oxygen species following activation of a photosensitizer. This *in vitro* study aimed to evaluate the cytotoxic effects of PDT using a nanoemulsion containing chloroaluminum phthalocyanine (ClAlPc/Ne) in breast cancer cell lines, with emphasis on triple-negative breast cancer (TNBC), a subtype associated with aggressive clinical course and limited therapeutic options. MCF-7 (luminal A) and MDA-MB-231 (TNBC) cells were incubated with ClAlPc/Ne for 24 hours, followed by photoactivation at increasing light doses (1, 4, and 16 J/cm²) and subsequent viability assessment using the MTT assay. Control conditions included nanoemulsion without photosensitizer and non-irradiated cells. ClAlPc/Ne-mediated PDT induced dose-dependent phototoxicity in both cell lines, with greater sensitivity observed in MDA-MB-231 cells compared to MCF-7 ($p < 0.05$). IC₅₀ values for TNBC cells decreased from 1.96 μM (1 J/cm²) to $< 0.01 \mu\text{M}$ (16 J/cm²), indicating enhanced susceptibility to oxidative stress. In contrast, MCF-7 cells demonstrated comparatively lower sensitivity at equivalent conditions. These findings indicate that PDT with ClAlPc/Ne promotes selective cytotoxicity in TNBC cells and supports its potential as a localized therapeutic strategy. Although limited to an *in vitro* model, these results highlight its relevance as a candidate approach for the palliative management of cutaneous recurrence of breast cancer, aiming to improve local control and patient quality of life.

Ethics: *In vitro* study.

Keywords: triple-negative breast cancer; photodynamic therapy; cutaneous recurrence; palliative treatment; nanoemulsion.