Photofrin II-based photosensitization of human ovarian clear-cell carcinoma cell line (OvBH-1)

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Abstract:
The cytotoxic effect of photodynamic therapy (PDT) on ovarian clear-cell carcinoma cell line, OvBH-1 was achieved using different methods.
No clear morphological changes in OvBH-1 after PDT were observed, whereas PDT-treated MCF-7 breast carcinoma cells demonstrated morphological features of apoptosis. After PDT, OvBH-1 pattern of p53 expression remained unchanged, but MCF-7 cells revealed nuclear/cytoplasmic p53 expression. After PDT, a weak Bax protein induction was found in both PDT-treated cell lines. Bel-2 expression in PDT treated OvBH-1 cells remained unchanged, while it was markedly decreased in PDT treated MCF-7 cell line. MCF-7 cells expressed high level of neoeptiote cytokeratin 18 (CK 18) (M30), whereas low expression of neoeptiote cytokeratin 18 was found in OvBH-1, after PDT. The photofrin II PDT resulted in a significant reduction of the activity of mitochondrial enzymes in MCF-7 cells , as compared with that of OvBH-1 cells. The photofrin II effect, measured as a percentage of cells with high mitochondrial activity observed in MCF-7 cells at 3 and 6 h after PDT was low (6 and 3%, respectively), whereas in these conditions as many as 28.9% (at 3 h) and 30.42% (at 6 h) of OvBH-1 cells showed significantly higher activity of mitochondrial enzymes (p < 0.001). It is worth underlining that both methods, alkaline comet assay and flow cytometry, revealed that the majority of OvBH-1 cells (75–95.4%) were dead with the signs of necrosis, while in MCF-7 cells most of them (80–92%) died by apoptosis. Our in vitro preliminary results indicate that PDT causes non-apoptotic death in OvBH-1 cell line.

Key words:
OvBH-1, MCF-7 cell lines, PDT, apoptosis, necrosis