Natural killer cell cytotoxicity in oral squamous cell carcinoma cell lines after photodynamic therapy

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**Abstract**

**Statement of the problem:** Oral squamous cell carcinoma (OSCC) is an aggressive neoplasm with high rates of relapse. Photodynamic therapy (PDT) is a promising therapy for treatment of oral tumors in the early stages, however, its effectiveness is limited in the absence of T and NK (Natural Killer) cells. Thus, the objective of this study was to evaluate *in vitro* the cytotoxicity of NK cells after PDT. **Methodology:** The OSCC cell line CA1 was incubated with 5-ALA (1 mM) and exposed to different radiant exposure to determine the sublethal dose of PDT to be used in the cytotoxicity assay. Thus, cells were divided in the following groups: Control, 5-ALA, LED and PDT. Cellular viability was evaluated by the MTS assay. After 12h and 24h of treatment, cells from all groups were submitted to the Calcein-AM release assay using the NK92-MI cell line as effector cells in different concentrations. **Findings:** Ca1 cell line viability was reduced in all radiant exposures evaluated and the sub-lethal dose of PDT was observed with 3J/cm2. After 12h and 24h of PDT, no difference in regards to NK92-MI cytotoxicity was noticed in all groups evaluated. **Conclusion & significance:** PDT was able to decrease OSCC cellular viability at different radiant exposures. However, it seems that PDT was not able to increase the cytotoxic potential of NK92-MI cells against OSCC. Further studies considering 3D models and the tumor microenvironment are needed to better understand the effects of PDT on NK92-MI cells.



Biography

Bárbara Evelyn Santos de Lima, graduated in Nursing at Nove de Julho University in 2021, has received a fellowship to develop a research project on the effects of photodynamic therapy mediated by 5-ALA on cancer stem cells derived from oral squamous cell carcinoma. Actually, is studying for a Master’s degree in Biophotonics Applied to Health Sciences.

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