METHYLENE BLUE-MEDIATED PHOTODYNAMIC THERAPY IN TWO HUMAN RETINOBLASTOMA CELL LINES.

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Retinoblastoma, a cancer of photoreceptor elements of the retina, is the most common intraocular tumor of childhood. The type of treatment required depends on both the extent of the disease within the eye and whether the disease has spread beyond the eye. In the present work, we relate the use of Photodynamic Therapy with Methylene Blue, for the *in vitro* inactivation of human retinoblastoma cell lines. The study of MB concentration dependence showed a higher cellular uptake in the Y79 (48%) than in WERI-Rb (34%) cell line. The phototoxicity of MB appeared to be more sensitive in the Y79 cell line than in the WERI-Rb, as indicated by the combination of MB concentration and light doses to kill 50% of the cell population (LD_{50}): 10μM and 7J/cm^2 or 10J/cm^2, and 20μM and 5J/cm^2. With the WERI-Rb cells the LD_{50} condition occurs at high MB concentration and light doses: 10μM and 15J/cm^2, and 20μM and 7J/cm^2. The accentuated MB photodynamic activity observed in the Y79 cell line can be explained as a result of the higher cellular uptake and intracellular singlet oxygen production. The mechanism of cell death that follows the PDT treatment was monitored by FACS. Two effects were observed, growth inhibition (at low MB concentration and light doses) and apoptosis induction (at high MB concentration and light doses).

Keywords: Singlet oxygen, Apoptosis, Dose and Concentration Effects.

Supported by FAPESP.