Assessing the survival of mrc-5 and a549 cell lines upon exposure to ascorbic Acid and sodium ascorbate - biomed 2011.

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Source

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Abstract

Lung cancer is among the highly prevalent and deadly cancers in the United States and worldwide. Cells that are cancerous exhibit higher rates of glycolysis as compared to normal cells. In an attempt to exploit this uniquely enhanced glucose-dependent ATP generation phenomenon, the authors hypothesize that exposure of cancer cells to normal organic metabolites that are capable of inhibiting glycolysis would have a negative impact on survival by altering growth and viability characteristics vastly through decline in ATP build up essentially leading to collapse in energy supply; normal lung cells will not demonstrate such changes. The human lung fibroblast cell line MRC-5 and the cancerous human lung alveolar epithelial cell line A549 were utilized in this study as in vitro models of normal and cancerous lung cell lines respectively. Using standard methods, both cell lines were maintained in culture and exposed to ascorbic acid and sodium ascorbate reagents at concentration levels ranging from 31.3-2,000 µg/ml. Cell survival measurements using MTT and T4 Cellometric assays monitored with phase-contrast photo-imaging were carried out in quadruplicates. Results indicate that exposure characteristics to these metabolites followed concentration-dependent cell mortality/survival curves by the cancerous versus normal cell lines respectively. Ascorbic acid and sodium ascorbate showed statistically significant (p<0.05) differential negative effects on the cancerous A549 cell line in comparison to unexposed controls as well as to effects measured with the normal lung MRC-5 cell line; this is highly indicative of a promising therapeutic potential.

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