The Effect of Nitric Oxide on Cellular Adhesion in Head and Neck and Breast Cancer Cells

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Cellular adhesion, the binding of a cell to a surface or another cell, plays a major role in cancer progression. Studies show that nitric oxide (NO), which is found in elevated levels in cancer cells, greatly affects cellular adhesion. However, the data is conflicting as to whether NO promotes or inhibits cellular adhesion. In this investigation the cell adhesion of head and neck and breast cancer cell lines were analyzed to clarify the relationship between NO and cell adhesion. Each cell line used was divided into two groups: the parental cell line, unmodified cultured cancer cells, and high nitric oxide (HNO), cells that were adapted to survive in high levels of NO. Five sets of cell solution from both groups were placed on a mixer for one to five hours. Cells were then counted as either single, double (two cells bound together), or clumps (three or more cells bound together). By counting the amount of adjoined cells, the amount of cell adhesion between the cells can be determined. The HNO cell lines were compared against the parental cells to see for changes in cellular adhesion. The head and neck cancer cells exposed to NO had an increase in the number of single cells with a decrease in double and clumped cells. This indicates decreasing cell adhesion. A similar but less drastic trend was also seen with the breast cancer cells. Consequently NO has been determined to decrease the cell adhesion in head and neck and breast cancer cells.

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