High nitric oxide levels in head and neck Squamous Cell Carcinomas (SCC) has shown down regulation of Cadherin Type-1 (CDH1) gene

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Hypothesis: In head and neck squamous cell carcinomas, high Nitric Oxide (HNO) levels cause down regulation of genes that has metastatic potential.

Objectives: Nitric oxide is a signaling molecule that in its chemical compound is a powerful vasodilator and a free-radical that all cells in our body produce. At normal levels nitric oxide helps cells to communicate and transmit signals throughout the body. In cancer patients’ high levels of nitric oxide are cytotoxic and low levels are considered cytostatic. Cell adhesion, cell signaling and cell communication are regulated by protein coding genes and overexposure to HNO down regulates these genes. High nitric oxide levels were present in four of the H&N SCC cell lines, in order to study more on the relationship between HNO (high nitric oxide) levels and its metastatic potential. It was observed that HNO in H&N SCC cell lines caused down regulation of CDH1 in all the four cell lines. Abnormalities in tumor suppressor protein coding genes are one of the causes of carcinogenesis. In this case, CDH1 was found to be down regulated. CDH1 gene provides a manual for producing proteins that code for epithelial cadherin or E-cadherin. E-cadherin plays an important role as a tumor suppressor gene as it regulates cell adhesion and cell proliferation.

Methods: In this study we adjusted the H&N SCC cancer cell lines SCC016, SCC040, SCC056, and SCC114 to HNO. Nitric oxide levels were increased to HNO by DETA-NONOate. DNA microarray was performed in order to compare the control cell line and HNO cell line.

Results: HNO levels in adapted H&N SCC cell lines caused CDH1 genes to be down regulated.

Conclusion: It was studied that adapting HNO to H&N SCC cell lines down regulates CDH1 (Cadherin-1) gene which means that the gene expression is either reduced or decreased which increases the metastatic potential. Further research is needed to observe the relationship between carcinogenesis, CDH1 and levels of nitric oxide.

Biography

Saarah Alkhairy has received her Bachelor degree in Business Management from Purdue University, Indiana. Her goal is to combine healthcare and business to affect society on a larger scale. This may include education, pharmaceuticals, and research. She published an abstract in the American Thoracic Society 2016 on PFT in Muscular Dystrophy with Sleep Disordered Breathing in Children and Adolescents. The aim was to determine if the AHI correlates with abnormal PFTs in order to predict the need for a nocturnal polysomnogram. She was an Associate Editor of Wikidoc and a Research Fellow at Perfuse Study Group in Beth Israel Deaconess Medical Center, Massachusetts. She added content and edited highly read and searched topics including bronchiectasis, sleep apnea, interstitial lung disease, colorectal cancer, lung cancer, and basal cell carcinoma for the world's largest medical wiki.

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