N-acetylcysteine (NAC) inhibits cell growth by mediating the EGFR/Akt/HMG box-containing protein 1 (HBP1) signaling pathway in invasive oral cancer.

Lee MF, Chan CY, Hung HC, Chou IT, Yee AS, Huang CY.

Department of Nutrition and Health Sciences, Chang Jung Christian University, Tainan, Taiwan, ROC.

Abstract

Objectives: Overexpression of the epidermal growth factor (EGF) receptor (EGFR) gene in the squamous cell carcinomas of the head and neck (SCCHN) is often associated with inauspicious prognosis and poor survival. N-acetylcysteine (NAC), a compound from some vegetables and allium species, appears anti-tumorigenesis, but the underlying mechanism is unclear. The objective of this study is to investigate the role of NAC in EGFR-overexpressing oral cancer. Materials and methods: Both HSC-3 and SCC-4 human tongue squamous carcinoma cell lines and an HSC-3 xenograft mouse model were used to test the anti-growth efficacy of NAC in vitro and in vivo, respectively. Results: NAC treatment suppressed cell growth, with concomitantly increased expression of HMG box-containing protein 1 (HBP1), a transcription suppressor, and decreased EGFR/Akt activation, in EGFR-overexpressing HSC-3 oral cancer cells. HBP1 knockdown attenuated the growth arrest and apoptosis induced by NAC. Lastly, NAC and AG1478, an EGFR inhibitor, additively suppressed colony formation in HSC-3 cells. Conclusion: Taken together, our data indicate that NAC exerts its growth-inhibitory function through modulating EGFR/Akt signaling and HBP1 expression in EGFR-overexpressing oral cancer.

Copyright © 2012 Elsevier Ltd. All rights reserved.

PMID: 22944050 [PubMed - in process]