The Impact of Clinical and Epidemiological Variables on the Mutational Status of Epidermal Growth Factor Receptor (EGFR) Gene in Non-Small Cell Lung Cancer (NSCLC) Patients from Eastern India

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ABSTRACT

Purpose: The prevalence of epidermal growth factor receptor (EGFR) mutations in lung cancer patients is higher in adenocarcinomas, in women, and in Japanese. To further investigate the prevalence of EGFR mutations in relation to ethnic and geographic factors, we evaluated EGFR mutations in a series of Indian patients with Non-small Cell Lung Cancer (NSCLC) which had not been previously reported.

Experimental Design: We retrospectively studied 80 NSCLC samples for mutations in the EGFR; exons 18, 19, and 21 were analyzed by Polymerase Chain Reaction / Bidirectional Gene Sequencing. Correlation between EGFR mutations and patient characteristics, including sex, smoking history, and pathologic subtypes, were evaluated by using the $\chi 2$ test and logistic regression analysis.

Results: EGFR mutations were detected in 22.5%. In frame deletion in exon 19, 55.56% were the most frequent mutations detected. EGFR mutations were more frequent in women (30.30%) than in men (17.02%), more frequent in never smokers (24.6%) than in current smokers and former smokers (17.39%). In pure adenocarcinoma patients, 22.6% were mutated and 66.77% adenocarcinoma with bronchioloalveolar carcinoma (BAC) histology were tested positive for mutation. All 15 squamous cell lung cancer patients and 3 large cell lung cancer patients tested came as negative for mutation. So EGFR mutations were more frequent in adenocarcinoma patients when compared with non adenocarcinoma group of NSCLC patients **(p value 0.002).** Among two types of adenocarcinoma, mutations were more common in adenocarcinoma with BAC features when compared to pure adenocarcinoma patients **(p value 0.016).** Logistic regression analysis demonstrated that BAC, including adenocarcinomas with any bronchioloalveolar features (Odds Ratio [OR] 6.664; 95% CI, 1.415 to 31.391; **p value 0.016),** were significantly associated with

EGFR mutations but EGFR Mutations were not independently associated with never/former smoker status and female sex (OR:1.299 and 0.789 respectively).

Conclusion: In Eastern India most of the EGFR positive lung cancer patients were not only female but also non smoker with adenocarcinoma histology either pure adenocarcinoma or mixed with BAC features.

Keywords: EGFR, NSCLC, Adenocarcinoma, BAC.