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JC VIRUS AS A POSSIBLE ETIOLOGICAL AGENT IN NON SMALL CELL LUNG CARCINOMAS (NSCLC): A REVIEW OF 135 CASES

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Background : JC virus (JC) is a polyoma virus closely related to the simian virus-40 and is endemic in the human population. Its subclinical presence has been implicated as a mutagenic agent in immunocompetent as well as immunosuppressed patients. These oncogenic properties are mediated by T antigen (Tag) which binds both p53 and retinoblastoma (Rb) proteins. In this study we evaluated the expression of JC and Rb proteins by immunohistochemistry in NSCLC to evaluate a possible viral etiology in these malignancies.

Design: Paraffin-embedded sections of 135 NSCLC were immunostained with monoclonal anti JC antibody (clone 5.12.2, Cat#NCL-JC, Novocastra Labs, Newcastle upon Tyne, U.K.) and anti Rb protein antibody (clone3C8, Cat#3107, QED Bioscience Inc, San Diego, CA) using the ABC technique. Nuclear staining for JC was evaluated as negative (<5% nuclear positivity), focal positive (5-50%) and diffuse positive (>50%). Nuclear expression for Rb was evaluated as negative (<10%) and positive (>10%).

Results: Sixty-six (49%) of the cases were adenocarcinomas (AC) and 69 (51%) were squamous cell carcinomas (SCC). Of these, 41% cases showed JC expression. Statistically, a significantly higher JC expression was seen in AD as compared to SCC (p=0.020). No significant correlation was observed between JC expression and tumor differentiation or smoking status. Correlative expression of JC and Rb was observed in 124 cases as the following permutations: JC+/Rb+ (50 cases); JC+/Rb-(4); JC-/Rb+ (65) and Jc-/Rb- (8)

Conclusion: Expression of JC may indicate a viral etiology for bronchopulmonary carcinomas, especially AD. A high association of JC expression with Rb positivity may signify either a subclinical infection with stabilized Rb protein and loss of suppressor function. Further evaluation of this group is warranted to establish the mutagenic effect of JC in NSCLC.

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