Abstract

Tissue rigidity in pre-malignant and malignant lung squamous cell carcinoma stages In Vivo.

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Lung squamous cell carcinoma (LSCC), a subtype of non-small cell lung cancer, has resulted in numerous deaths globally. One of the emerging hallmarks of cancer is increased tissue rigidity, which is crucial for cancer growth. This increased rigidity is linked to treatment resistance, poor prognosis, and lower survival rates in cancer patients. Despite its importance, the characterization of tissue rigidity in the dual stages of lung squamous cell carcinoma (SCC) carcinogenesis remains undefined. Therefore, this study focused on investigating tissue rigidity in both the pre-malignant and malignant stages of lung SCC in vivo. BALB/c mice were randomly assigned to 4 groups (n=8 mice per group): pre-malignant (PM) and malignant (M) groups, along with vehicle control (VC) groups for both PM and M. N-nitroso-tris-chloroethylurea (NTCU) was used to induce PM and M lung SCC in the respective groups for 15 and 30 weeks. Significant increases in both collagen content and tenascin-C protein expression were observed in the M group ($p<0.05$) compared to the other groups. Additionally, collagen rigidity analysis indicated a notable increase in the M group ($p<0.05$) compared to the others. In conclusion, this study suggests that tissue rigidity increases as carcinogenesis progresses from the pre-malignant to malignant stage. This finding supports the potential of targeting tissue rigidity as a novel mechano-therapeutic approach for lung SCC.

Keywords: lung cancer, tissue rigidity, squamous cell carcinoma, pre-malignant, malignant.