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Smoking as an independent risk factor for hepatocellular carcinoma due to the α7nAChR modulating the JAK2/STAT3 signalling axis

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Abstract

Background: Hepatocellular carcinoma (HCC) is a worldwide health problem. Currently, there is no effective clinical therapeutic strategy for HCC. Smoking is associated with several malignant diseases including cancers. Experimental approach: However, the impact of smoking on HCC is still unresolved. Retrospectively reviewed HCC patients diagnosed between 1 January 2010 and 31 December 2015 at Taipei Medical University-Shuang Ho Hospital (Ministry of Health and Welfare). We found that smoking was associated with a poor prognosis, especially recurrence and patient survival after curative surgery using a clinicopathological analysis. Results: Our univariate and multivariate analyses showed that the α7-nicotinic acetylcholine receptor (α7-nAChR) was an oncogene and risk factor for post-resection recurrence. The α7-nAChR was overexpressed in HCC tissues compared to their non-tumour counterparts. Silencing the α7-nAChR reduced the viability of HCC cells, suppressed cellular proliferation, attenuated migration and invasion, and diminished the tumour's sphere-formation ability, with concurrent downregulation of expression levels of the TGR5, p-JAK2, p-STAT3 (Tyr705/Ser727), RhoA, ROCK1, MMP2, and MMP9 proteins. Furthermore, a positive correlation was found between α7-nAChR and JAK2 expressions (p = 0.01) in HCC specimens, as well as their membranous co-localization. Conclusion: Together, we demonstrated that the α7-nAChR may be an independent prognosticator of the progression and prognosis of HCC patients. These findings suggest that the α7-nAChR drives the progression and recurrence of HCC through JAK2/STAT3 signalling and is a novel target for anti-HCC therapy.
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Biography

Ching Li Li is a PhD student of Graduate Institute of Clinical Medicine, College of medicine, Taipei Medical University. She is also a general surgeon of Sijhih Cathay General Hospital, New Taipei City, Taiwan. Expert in laparoscopic oncology surgery. She is ever a international medical surgeon of Marshall Island Majuro hospital. She has her expertise in evaluation and passion in improving the health and wellbeing. Her practice focus on the liver cancer, hepatocellular carcinoma, and works in conjunction with researchers at the medical centre to pioneer clinical research which focuses on anticancer therapies.

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