Abstract

Backgrounds: Epithelial mesenchymal transition (EMT) is a critical process involved in the invasion and metastasis of cancer, including lung cancer (LC). Transforming growth factor (TGF)-β is one of factors capable of inducing EMT. Polyinosinic-polycytidylic acid (polyI:C), a synthetic agonist for toll-like receptor (TLR) 3, can enhance immune responses and has been used as an adjuvant for cancer vaccines; however, it remains unclear whether it influences other process, such as EMT. In the present study, we examined the effects of polyI:C on TGF-β-treated A549 human LC cells.

Methods and results: By in vitro cell proliferation assay, polyI:C showed no effect on the growth of A549 cells treated with TGF-β1 at the concentration range up to 10 μg/ml; however, it markedly suppressed the motility in a cell scratch and a cell invasion assay. By Western blotting, polyI:C dramatically decreased TGF-β1-induced Ak strain transforming (Akt) phosphorylation and increased phosphatase and tensin homologue (PTEN) expression without affecting the Son of mothers against decapentaplegic (Smad) 3 phosphorylation or the expression level of E-cadherin, N-cadherin or Snail, indicating that polyI:C suppressed cell motility independently of the 'cadherin switching'. The Akt inhibitor perifosine inhibited TGF-β1-induced cell invasion, and the PTEN-specific inhibitor VO-OHpic appeared to reverse the inhibitory effect of polyI:C.

Conclusion: PolyI:C has a novel function to suppress the motility of LC cells undergoing EMT by targeting the phosphatidylinositol 3-kinase /Akt pathway partly via PTEN and may prevent or reduce the metastasis of LC cells.

Word count: 238

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