Epithelial Mesenchymal Transition Enhances Perineural Invasion in Pancreatic Adenocarcinoma

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Pancreatic adenocarcinoma is one of the most common causes of cancer-related death. Perineural invasion (PNI) occurs frequently in pancreatic adenocarcinoma and correlates with poor prognosis. Epithelial Mesenchymal Transition (EMT) of carcinoma cells is associated with increased motility and invasiveness. The relationship between these two processes has not been established. The study hypothesis was that EMT contributes to PNI. In order to test the hypothesis, PANC-1 cells were transfected with human Twist1 gene to induce EMT. Boyden chamber motility assays using dorsal root ganglion (DRG) as substrate were performed to evaluate for cell motility. In vitro DRG models of nerve invasion were also performed to evaluate cell invasion. The study results showed that EMT leads to increase in motility and invasiveness of pancreatic carcinoma. Cells with EMT phenotype moved through the membrane in the Boyden chamber assay in greater number and, similarly, invaded DRG in higher number in the in vitro DRG model of nerve invasion model. These findings indicate that cells with EMT phenotype have greater motility and invasiveness potential for PNI. Therefore, inhibition of the EMT mechanism represents a potential therapeutic target that can be used to decrease PNI, and thus, improve the prognosis of pancreatic adenocarcinoma.