

Role of cholesterol transporters, ABCA1 and ABCG1 in cholangiocarcinoma

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Abstract:

Statement of the Problem & Purpose: Epidemiology of cholangiocarcinoma (CCA) is high in Thailand and Southeast Asia. It is highly aggressive and poorly studied. In this investigation, the role of cholesterol transporters, ATP-binding cassette (ABC) A1 and ABCG1 are studied in HuCCA-1 cell line. ABCA1 and ABCG1 transporters are suspected to play a role in CCA lipid homeostasis.

Methodology: The expression and localization of ABCA1 and ABCG1 were investigated by western blot analysis and immunocytochemistry, respectively. The functions of ABCA1 and ABCG1 in CCA cells were examined out by cholesterol efflux assay to specific cholesterol acceptor and high-density lipoprotein (HDL). ABCG1 transporter was down regulated using siRNA interference. Cell phenotypic changes such as cell migration and cholesterol export ability were observed by wound healing and cholesterol efflux experiments, respectively. Findings: ABCA1 and ABCG1 transporters were expressed in HuCCA-1 cells. Correspondingly, localization of ABCA1 was exhibited around the nucleus while ABCG1 pattern was more scattered throughout cytoplasm. Moreover, cholesterol exports via ABCA1 and ABCG1 to HDL were observed. While ABCG1 level was down regulated, the retention of ABCA1 expression was illustrated. Comparable level of cell migration was displayed between control and ABCG1 silenced cells. In addition, there were no change in cholesterol efflux to HDL among these treatments.

Conclusion & Significance: This research indicated the expressions and cholesterol export function of ABCA1 and ABCG1 in CCA. While silencing ABCG1, there was no obvious cell phenotypic characteristics such as wound healing and cholesterol efflux. This hints the possible and predominant role of ABCA1 transporter in CCA which requires further study. This investigation sheds light on cholesterol biology and possible therapeutic target in CCA.

Biography:

Pattaya Seeree is currently a PhD student in Department of Biology at Mahidol University, Thailand. She has received her Bachelor's degree in Biomedical Science in 2010 at Griffith University, Australia, followed by Master's degree in Biotechnology at Queensland, University of Technology, Australia. She is a Recipient of National Research Council of Thailand (NRCT) scholarship for her PhD research funding.

She has her expertise in cancer biology and ATP-binding cassette (ABC) transporter. Her work is focused on cholesterol transporters in term of their molecular biology, roles and as a possible biomarker for cholangiocarcinoma.