Metabolic Features Of Bile-Derived Exosomes From Patients With Various Gallbladder Diseases

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Background : Exosomes can be extracted from various types of body fluids, and recent studies on their association with various type of diseases have been actively conducted. However, studies on the association between gallbladder disease and bile-derived exosomes have not been well studied. Here, we analyzed the metabolic changes of exosomes in patients with several gallbladder diseases, including gallbladder cancer.

Methods : We collected bile from a total of 13 patients with gallbladder cancer, gallbladder polyp, cholecystitis and no pathology from liver donor. Exosomes were extracted from the bile of these patients, and LC-MS/MS based untargeted metabolomics and miRNA profiling were performed using the bile-derived exosomes.

Results : Exosomes derived from the bile of each patients showed different characteristics for each disease. In particular, characteristic findings were found in gallbladder cancer. First, various unsatured phosphatidylethanolamines and phosphatidylcholines, which are known to be related to exosome membrane integrity, were significantly reduced compared to other groups. Second, miR-181c and palmitic acid were overexpressed and conjugated deoxycholic acid was decreased, which is known to be highly correlated with the activity of the PI3K/AKT pathway.

Conclusions : According to this study, we found that the bile derived exosomes have characteristic metabolic features depending on the type of gallbladder diseases. In particular, in the case of bile-derived exosomes derived from GB cancer, it showed characteristic altered metabolits that distinguish it from other diseases. We believe that our metabolonomics and miRNA profiling can provide important information for understanding Gallbladder cancer in the future.

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