Translational research

Serum microRNAs as potential biomarkers for lung cancer

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Aim/Background: MicroRNAs (miRNAs) are single-stranded RNA species that constitute a class of non-coding RNAs, and are emerging as key regulators of gene expression. In our previous study, we identified significantly differentially expressed miRNAs and mRNAs between lung cancer and normal tissue by means of massively parallel sequencing. In this study, we investigated serum miRNA expression to compare non-small-cell lung cancer (NSCLC) patients and controls by our previous studied miRNA profiles.

Methods: This study involved RNA isolation from 184 sera specimens including those from lung cancer patients and age- and gender-matched controls (n = 92 each). Serum RNA was isolated with miRNeasy Serum/Plasma Kit (Qiagen), and reverse transcription was performed using the miScript II RT Kit (Qiagen) according to the manufacturer’s instructions. cDNA of microRNA was amplified using the miScript miRNA PCR Array as follows: let-7c-5p, miR-21-5p, miR-338-3p, miR-133a-3p, miR-139-5p, miR-144-5p, miR-182-5p, miR-196a-5p, miR-196b-5p, miR-205-5p, miR-206-3p, miR-615-3p, miR-891a-5p, miR-944, miR-1246, and for internal control mir-191-3p (Qiagen). The data were analyzed using the PCR array data analysis tools (Qiagen). Appropriate informed consent was obtained from the participants, and the Institutional Review Board of the Kangwon National University Hospital (Chuncheon, Korea) approved the study.

Results: miR-21-5p, miR-144-5p, miR-182-5p, miR-205-5p, miR-891a-5p and miR-1246 was found to be present at substantially higher levels in lung cancer compared with control sera, as indicated by an absolute fold change ≥ 1.0 and P < 0.05. And miR-1246 was most significantly higher level in in lung cancer compared with control sera (fold change = 5.6, p-value < 0.05).

Conclusions: Differences in miRNA profile identified support circulating miRNAs having potential as diagnostic biomarkers for lung cancer. More extensive studies of lung cancer and control serum specimens are warranted to independently validate the potential clinical relevance of these miRNA s as minimally invasive biomarkers for lung cancer.

Disclosure: All authors have declared no conflicts of interest.