AB017. Circulating exosomal miRNAs as potential diagnostic and prognostic biomarkers for thymic squamous cell carcinoma

Qiangling Sun[1], Wentao Fang[2]

[1]Institute of Thoracic Oncology, Shanghai Chest Hospital, School of Medicine, Shanghai Jiao Tong University, Shanghai, China; [2]Department of Thoracic Surgery, Shanghai Chest Hospital, School of Medicine, Shanghai Jiao Tong University, Shanghai, China

Correspondence to: Qiangling Sun, PhD. Institute of Thoracic Oncology, Shanghai Chest Hospital, School of Medicine, Shanghai Jiao Tong University, No. 241, West Huaihai Road, Xuhui District, Shanghai 200030, China. Email: shqling@163.com.

Background: Thymic squamous cell carcinoma (TSCC) is currently one of the most aggressive primary mediastinal tumors. It is usually associated with poor prognosis due to the advanced stage when diagnosed. However, no specific biomarkers have been identified for the diagnosis and prognosis prediction of TSCC. This study aimed to assess the performances of circulating miRNAs in aiding the diagnosis and predicting the prognosis of TSCC.

Methods: Sixty-three TSCC patients who underwent mediastinal tumor surgery and 37 non-thymic tumor patients were enrolled in this research. The upstream regulatory miRNAs of TSCC were predicted with ingenuity pathway analysis (IPA) software using our previous thymic epithelial tumors' proteomics database. MicroRNAs expression profiling was performed by Q-PCR analysis of TSCC tissue. Exosomes were isolated from the plasma of 36 TSCC patients and 37 non-thymic tumor controls. Q-PCR was performed to detect the expression level of circulating exosomal miRNAs. Their correlation with clinicopathologic parameters was explored. Receive operator characteristic (ROC) curve was performed to confirm the diagnostic efficiency of miRNAs.

Results: Four miRNAs were predicted to be the upstream regulators of TSCC by IPA bioinformatic analysis. Q-PCR showed that miR-16-5p was significantly downregulated in tumor tissues, while miR-2682-5p, miR-6748-5p, and miR-3714-5p were significantly upregulated. TSCC plasma exosomal miR-2682 and miR-6748 were significantly higher, while miR-16-5p was lower compared to non-thymic tumor controls. Elevated levels of exosome-derived miR-2862-5p were associated with advanced tumor stage, and lower levels of exosomal expression of miR-16-5p were associated with shorter progression-free survival in TSCC patients ($P<0.05$). Both exosomal miR-16-5p and miR-2682-5p expressions were found to show good diagnostic yield, with area under the curve (AUC) of 0.6667 [95% confidence interval (CI): 0.522–0.811, $P<0.05$] and 0.6550 (95% CI: 0.504–0.806, $P<0.05$), respectively. Diagnostic accuracy was further improved when both miRNAs were combined, with an AUC of 0.792 (95% CI: 0.663–0.920, $P<0.0001$).

Conclusions: The role that exosome and exosomal miRNAs play in TSCC was discussed and investigated for the first time. Plasma exosomal miR-16 and miR-2682 levels may serve as useful non-invasive biomarkers for aiding the diagnosis of TSCC and the level of exo-miR-16 is suggestive of TSCC patients' prognosis.

Keywords: Thymic squamous cell carcinoma (TSCC); miRNAs; exosome; diagnosis; prognosis

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Footnote

Conflicts of Interest: Both authors have completed the ICMJE uniform disclosure form (available at https://med.amegroups.com/article/view/10.21037/med-23-ab017/coif). Both authors report this study was supported by National Natural Science Foundation of China (Nos.: 82073285 and 82072569). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). The study was approved by the ethics board of Shanghai Chest Hospital (No.: KS22008) and informed consent was obtained from all individual participants.

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