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Circulating and Salivary microRNA Expression Analysis in Nasopharyngeal Carcinoma in East Coast Region of Peninsular Malaysia

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ABSTRACT

Objectives/Research Problem: Nasopharyngeal carcinoma (NPC) is among the common cancer in Malaysia and is usually diagnosed in the late stages. Current diagnosis procedure relies only on invasive biopsy analysis. MicroRNAs (miRNAs) are a group of short nucleotides that are stable in blood and its expression correlates to malignancy. Hence, circulating miRNAs could serve as promising non-invasive biomarker for tumor diagnosis. This study is conducted to determine the circulating and salivary miRNAs expression as potential non-invasive biomarker for early detection of NPC.

Materials and Method: Plasma and saliva will be collected from 50 newly diagnosed NPC and control subjects. Total RNA will be extracted from both samples using NucleoSpin® miRNA kit. Six total RNA extracts from plasma of NPC and control subjects will be subjected to profiling using Taqman® Array Card. Five significant miRNAs will be selected for validation using plasma and saliva samples. The profiling and validation data will be analysed using ExpressionSuite and R Studio software.

Results and Discussion: The purpose of this report is to present our results on quality assessment of the isolated circulating RNAs. Spectrometry data on total RNA extracts showed that all extracts have low total RNA concentration (<12 ng/μL) and low 260/280 and 260/230 ratios (<1.8). However, fluorometry data showed high expression of ath-miR-159a (Cq 19.95±0.65) and hsa-miR-16 (Cq 23.36±1.3) in all extracts. The low concentration of total RNA was expected, as RNA concentration in blood was low. Meanwhile, the contamination of all extracts was suspected due to guanidine thiocyanate compound that contained in the extraction buffers. However, the fluorometry results confirmed that this contamination did not interfere the downstream application, which is qPCR.

Conclusion: The quality control data showed that the fluorometry method is better than the spectrometry method in assessing the quality of total RNA extract for circulating miRNA study.

KEYWORDS: Circulating miRNA, Nasopharyngeal Carcinoma, Quality Control, Total RNA Extract

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