

Accepted Manuscript

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PII: S0882-4010(17)30316-9

DOI: [10.1016/j.micpath.2017.04.033](https://doi.org/10.1016/j.micpath.2017.04.033)

Reference: YMPAT 2237

To appear in: *Microbial Pathogenesis*

Received Date: 25 March 2017

Revised Date: 22 April 2017

Accepted Date: 24 April 2017

Please cite this article as: Behdarvand A, Zamani MS, Sadeghi F, Yahyapour Y, Vaziri F, Jamnani FR, Nowruzi B, Fateh A, Siadat SD, Evaluation of Merkel cell polyomavirus in non-small cell lung cancer and adjacent normal cells, *Microbial Pathogenesis* (2017), doi: 10.1016/j.micpath.2017.04.033.

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Evaluation of Merkel Cell Polyomavirus in non-small cell lung cancer and adjacent normal cells

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ABSTRACT

Several risk factors have been linked to lung cancer (LC). Nevertheless, a viral etiology has been mentioned for a subset of patients developing LC. The aim of this study was to evaluate the effect of Merkel cell polyomavirus (MCPyV) on developing non-small cell lung cancer (NSCLCs). In total, 96 paraffin-embedded NSCLC biopsies and 96 adjacent non-LC normal specimens were analyzed by quantitative real-time polymerase chain reaction (PCR) for the existence of the MCPyV DNA and the expressions of RNA transcripts. Among the 96 enrolled participants, 42 patients were adenocarcinomas (ADs) and 54 patients were squamous cell carcinoma (SCC). Of the 42 ADs, MCPyV DNA was determined in 15 (35.7%) samples and of the 54 SCC, MCPyV DNA was detected in 22 (40.7%) samples. Only one non-cancerous sample in SCC subjects was positive for MCPyV *LT-Ag* DNA load (0.216×10^{-3}). In MCPyV-positive subjects, the median MCPyV copy number was higher in the patients with ADs (0.016×10^{-3} copies/cell) compared to SCCs (0.005×10^{-3} copies/cell); but this difference was not statistically significant ($P = 0.913$). In the seven stages of LC, the MCPyV *LT-Ag* was quantified in stage IV (0.204×10^{-3} copies/cell) more than in other stages. There was statistically significant difference between stages of cancer and MCPyV *LT-Ag* DNA load ($P = 0.002$). These results revealed for the first time the presence of MCPyV in a subset of patients with NSCLCs in Iran. Further studies should be carried out to clarify the role of MCPyV in lung carcinogenesis.

Keywords: Merkel cell polyomavirus; non-small cell lung cancer; adenocarcinoma; squamous cell carcinoma

1. Introduction

Lung cancer (LC) is a major global health problem worldwide, with more than ~1.6–1.7 million new subjects identified each year with this cancer [1]. This cancer is seen in men (33.8 per 100,000) more than in women (13.5 per 100,000) [2]. According to the World Health Organization (WHO) in 2002, LC is the 9th leading cause of death, and is responsible for the deaths of about 2% of patients. It is expected that in 2030, LC will be the 7th leading

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