

Investigation of the effects of hyperglycemia on the immunopathogenesis of respiratory syncytial virus in mouse model

Farshad Khodakhah¹, Alireza Tahamtan², Mona Marzban¹, Azadeh Shadab¹, Masoumeh Tavakoli-Yaraki³, Seyed Masiha Hashemi⁴, Talat Mokhatri-Azad¹, Vahid Salimi¹

1. Department of Virology, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran.
2. Department of Microbiology, School of Medicine, Golestan University of Medical Sciences, Gorgan, Iran.
3. Department of Biochemistry, School of Medicine, Iran University of Medical Sciences, Tehran, Iran.
4. Department of Immunology, School of Medicine, Shahid Beheshti University of Medical Sciences

Presenting Author Details:

Vahid Salimi, PhD

Associate professor

Department of Virology, School of Public Health, Tehran University of Medical Sciences, Enghelab street, Tehran, Iran.

Email: vahidsalimii@gmail.com

Tel/Fax: +98 21 88962343

Abstract

Respiratory syncytial virus (RSV) which lacks efficient vaccination yet, is raised from immune system dysfunction and obviously might affect patients with weak immune system responses likewise diabetics. On the other hand, diabetes mellitus as a chronic metabolic disease has widespread impact on body homeostasis which is associated with immune system impairment. In this study we evaluated the influence of hyperglycemia on immunopathogenesis of RSV in mouse model. Diabetic BALB/c mice were infected by RSV and 5 days following infection, the immunopathogenesis of RSV was investigated. Our results showed that hyperglycemic condition can alter the function of immune system against the RSV infection. Infiltration of immune cells into the BAL fluid in diabetic condition following the RSV infection was significantly decreased. The ratio of CD4/CD8 in RSV infection with diabetic condition compare to non-diabetic condition was statistically significant. In line with immune cells influx reduction (i.e. Neutrophil, Monocyte) concentration of inflammatory and pro-inflammatory cytokines i.e. IFN- γ and IL-17A were experienced decreasing trend while IL-10 as an anti-inflammatory cytokine was increased. In consistent, the pathological damage of lung tissue following immunopathogenesis aspect of RSV was reduced. However, diabetic condition significantly increased the viral load of RSV in BALF. Based on our data, hyperglycemic condition in short term can diminish the complications of RSV infection due to the inflammatory cells and cytokines decline. However, it seems that, because of increasing the viral load, it can accelerate the virus spreading and act as a hidden potential source of virus for other high risk population.