EuroSciCon

8th Edition of International Conference on

Infectious Diseases

June 07-08, 2018
London, UK

Chao Zhang et al., J Prev Infect Cntrol 2018, Volume 4
DOI: 10.21767/2471-9668-C1-002

INVOLVEMENT OF THE RENIN-ANGIOTENSIN SYSTEM IN THE PROGRESSION OF SEVERE HAND-FOOT-AND-MOUTH DISEASE

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Hand-foot-and-mouth disease (HFMD) is generally considered as a mild exanthematous disease to infants and young children worldwide. HFMD cases are usually mild and self-limiting but for few cases leads to complicated severe clinical outcomes, and even death. However, the mechanisms underlying the pathogenesis of severe HFMD remain unclear. Previous studies have indicated that serum Ang II levels in patients with H7N9 infection were related to the severity of infection. This study was undertaken to clarify the role of the renin-angiotensin system (RAS) in the progression of severe HFMD. In the present study, 162 children including HFMD patients and healthy controls were recruited. The data was analyzed by time-series fashion. Concentrations of angiotensin II (Ang II) and noradrenaline (NA) in serum of patients were measured with ELISA. We established a mouse model for enterovirus 71 (EV71) infection and determined concentrations of Ang II, NA in tissue lysates at 3, 5 and 7 days post infection (dpi). The concentrations of Ang II and NA in serum of the HFMD patients with mild or severe symptoms were significantly higher than that in healthy controls. Additionally, the concentrations of Ang II and NA in serum of severe cases were significantly higher than those mild cases and the increased concentrations of Ang II and NA showed the same time trend during the progression of HFMD in the severe cases. Furthermore, the concentrations of Ang II and NA in target organs of EV71-infected mice including brains, skeletal muscle, and lungs were increased with the progression of EV71 infection in mice. Histopathological alterations were observed in the brains, skeletal muscle and lungs of EV71-infected mice. Our study suggested that activation of the RAS is implicated in the pathogenesis of severe HFMD.

Recent Publications

1. Dang D, Zhang C, Zhang R, Wu W, Chen S, et al. (2017) Involvement of inducible nitric oxide synthase and mitochondrial dysfunction in the pathogenesis of enterovirus 71 infection. Oncotarget 8:81014-81026.
2. Jin Y, Zhang C, Zhang R, Ren J, Chen S, et al. (2017) Pulmonary edema following central nervous system lesions induced by a non- mouse-adapted EV71 strain in neonatal BALB/c mice. Virology Journal 14: 243.
3. Sui M, Huang X, Li Y, Ma X, Zhang C, et al. (2016) Application and comparison of laboratory parameters for forecasting severe hand-foot-mouth disease using logistic regression, discriminant analysis and decision tree. Clinical Laboratory 62(6):1023-31

Biography

Chao Zhang has his expertise in Epidemiology, mainly engaged in the pathogenesis of HFMD. He found that the activation of the renin angiotensin system is related to the severity of the disease (HFMD), whose team study on the hand, foot and mouth disease has lasted for nearly a decade.

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