High-mobility Group Box 1 Protein and Its Role in Acute Dengue Infection

Tzong-Shiann Ho[1*], Han Lee[2], Shih-Min Wang[1], Ching-Fen Shen[2], Yee-Shin Lin[3], Trai-Ming Yeh[4], Ching-Chuan Liu[2]

[1.] Department of Emergency Medicine, National Cheng Kung University Hospital, College of Medicine, National Cheng Kung University, Tainan, Taiwan, [2.] Department of Pediatrics, National Cheng Kung University Hospital, College of Medicine, National Cheng Kung University, Tainan, Taiwan, [3.] Department of Microbiology and Immunology, College of Medicine, National Cheng Kung University, Tainan, Taiwan, [4.] Department of Medical Laboratory Science and Biotechnology, College of Medicine, National Cheng Kung University, Tainan, Taiwan

Background/Objective

Dengue fever is a major arbovirus-borne infectious disease in tropical and subtropical regions of the world. The disease is generally mild and self-limited, but some patients may develop severe form of infection such as dengue hemorrhagic fever/dengue shock syndrome which often leads to death. Severity of dengue infections has been shown to be associated with the mobilization of numerous proinflammatory mediators. High mobility group box-1 (HMGB1), a ubiquitous, highly conserved 30 KDa nuclear DNA-binding protein has also been recently related to the severity of illness in dengue infections. In the current study, we aimed to investigate the roles of HMGB1 in acute dengue infections.

Method

Patients admitted to a tertiary medical center in Tainan, Taiwan with laboratory-confirmed dengue infection were enrolled from September to December, 2014. Demographic, clinical and laboratory data were analyzed. Serum levels of HMGB1, viral markers and selected mediators were determined by commercially available enzyme-linked immunoabsorbant assay kits.

Result

Totally 55 patients were enrolled in the study period. Serum HMGB1 levels were elevated in all dengue patients. HMGB1 levels tended to be higher in patients with elevated serum levels of AST/ALT and low platelet counts. A correlation between HMGB1 levels and severity of illness in dengue virus infection was established. The viral nonstructural protein 1 (NS1) accumulated at high levels in the plasma of dengue patients. The serum NS1 levels also correlates well with the concentrations of HMGB1 and macrophage migration inhibitory factor (MIF).

Conclusion

Serum HMGB1, viral NS1 and MIF levels were closely related to the severity of illness in dengue infections.