

Mast cell stabilizing effect of a geranyl acetophenone in dengue virus infection using in vitro model of DENV3-induced RBL-2H3 cells

ABSTRACT

Mast cells (MCs), a type of immune effector cell, have recently become recognized for their ability to cause vascular leakage during dengue virus (DENV) infection. Although MC stabilizers have been reported to attenuate DENV induced infection in animal studies, there are limited in vitro studies on the use of MC stabilizers against DENV induced MC degranulation. 2,4,6-trihydroxy-3-geranyl acetophenone (tHGA) has been reported to be a potential MC stabilizer by inhibiting IgE-mediated MC activation in both cellular and animal models. The present study aims to establish an in vitro model of DENV3-induced RBL-2H3 cells using ketotifen fumarate as a control drug, as well as to determine the effect of tHGA on the release of MC mediators upon DENV infection. Our results demonstrated that the optimal multiplicities of infection (MOI) were 0.4×10^{-2} and 0.8×10^{-2} focus forming units (FFU)/cell. Ketotifen fumarate was proven to attenuate DENV3-induced RBL-2H3 cells degranulation in this in vitro model. In contrast, tHGA was unable to attenuate the release of both β -hexosaminidase and tumor necrosis factor (TNF)- α . Nonetheless, our study has successfully established an in vitro model of DENV3-induced RBL-2H3 cells, which might be useful for the screening of potential MC stabilizers for anti-dengue therapies.

Keyword: DENV-3; RBL-2H3; In vitro mast cell degranulation; Ketotifen fumarate; tHGA