Effects of doxycycline on lowering IL-6 and TNF among patients with dengue haemorrhagic fever: a meta-analysis

Jenny Lyn Mangulabnan*, Frederick Ogbac

1Ospital Ng Makati; Medicine

2Ospital Ng Makati

Background: Dengue is the most important arthropod-borne viral infection of humans. In general, dengue fever is a disease with a benign course and low fatality rate. However, some of patients progress to a more severe disease characterized by bleeding, hematological abnormalities and plasma leakage. This more severe disease, previously known as dengue hemorrhagic fever (DHF), can lead to circulatory system collapse and death. Unfortunately, there is no specific treatment for dengue or its complications. Treatment by modulation of the cytokine response through use of drugs or antibodies has attracted considerable attention. While various antibiotics have been shown to possess immune modulating activities, those belonging to the tetracycline family appear to have the most promise.

Material/methods: A systematic review of articles using PubMed was done. Search terms included tetracycline, doxycycline and dengue. RCTs that evaluated the effects of doxycycline on cytokine levels of dengue hemorrhagic fever patients were included. Data extraction was performed by the primary author and reviewed by the co-authors. Studies were assessed for risk of bias using the Cochrane Collaboration tool. Statistical analysis was performed using Review Manager 5.3.

Results: Data was collected from 2 RCTs. In the pooled analysis using standardized (STD) paired difference in mean, doxycycline was favored in lowering the serum IL-6 and serum TNF, both in Day 3 and Day 7 post treatment with p value of < 0.00001.
Conclusions: Our study showed that doxycycline lowered the levels of serum IL-6 and TNF, cytokines that were directly implicated in the severe type of dengue. This might translate to better clinical outcome for severely ill dengue patients. Further studies should focus on the overall effect of doxycycline in lowering the mortality rate among dengue hemorrhagic fever patients.