Assessment of effect of vitamin E supplementation on oxidative stress levels in children infected with Dengue virus in Sri Lanka

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Dengue fever (DF) is a health crisis and oxidative stress plays a key role in pathogenesis. Exogenous supplementation of antioxidants can alleviate disease severity and improve recovery rates. This study aims to explore the effects of vitamin E on serum antioxidant levels and its association with overall disease outcomes in children with DF. A controlled clinical trial was conducted at two paediatric units as the treatment group and the control group at a children's tertiary care hospital, enrolling children (5-14 years) with clinically suspected DF admitted within 84 hours of onset of fever. The treatment group, received an age-appropriate vitamin E dose within the first 24 hours of admission. Haematological and serum biochemical parameters [white blood cell (WBC), albumin, calcium] were monitored according to routine management protocols. Serum Trolox equivalent antioxidant capacity (TEAC) and uric acid (UA) were analysed using the ABTS and a colorimetric assay respectively in blood samples collected during routine blood collection. Data were analysed using Graphpad prism 10.4.1. version and Spearman rank correlation analysis was performed to determine the correlations between the parameters. Data of 35 subjects (treatment group N=27 and control group N=8), average age 9 years (IQR=4), admitted on day 3 of illness on average was analysed. Progression of the patients to Dengue Haemorrhagic Fever (DHF) and duration of the leaking phase was lower in the treatment group. The TEAC was improved throughout the course of illness following vitamin E supplementation. Moderate positive correlation was depicted between TEAC and UA ($r = 0.5238$, $p=0.1966$), TEAC and WBC count ($r = 0.5714$, $p=0.1511$) and TEAC and calcium ($r =0.3810$, $p= 0.3599$). Non-significant negative correlation was identified between TEAC and albumin ($r= -0.6190$ $p =0.1150$). Definitive establishment of the correlations were limited by the smaller sample size. This preliminary study indicates that vitamin E improves and maintains serum TEAC of dengue patients by improving compensatory serum antioxidants such as UA. Future studies should be carried out with large sample size to further validate these observations.

Keywords: *Dengue Fever*; *Oxidative stress*; *Antioxidants*; *Vitamin E*; *Serum TEAC*