

Infectious Diseases

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

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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 in 2.5-20% of patients. Unfortunately, there is no specific treatment for dengue or its complications. However, 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.

Aim: Aim of this study is to assess the effect of doxycycline on lowering IL-6 and TNF among patients with dengue hemorrhagic fever.

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 two RCTs. In the pooled analysis using standardized (STD) paired difference in mean, doxycycline was favored in lowering the serum IL-6 and serum TNE, both in day three and day seven post-treatment with p value of < 0.00001.

Conclusions: Our study showed that doxycycline lowered the levels of serum IL-6 and TNF; cytokines 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.

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Detection of mupirocin resistance in methicillin-resistant *Staphylococcus aureus* isolates at Egyptian hospital

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Objective: Topical mupirocin has the power to eradicate nasal carriage of methicillin-resistant *Staphylococcus aureus* (MRSA). However, mupirocin resistance has been increasingly reported. The aim of this study was to determine the prevalence of mupirocin resistance in MRSA isolates from clinical and nasal samples by conventional and molecular methods and to test their susceptibility to other antibiotics.

Materials & Methods: A total of 60 MRSA non-duplicate isolates were included in this study, 14 from surgical wounds, 16 from urinary tract infections from patients admitted to Suez Canal University Hospital, Ismailia, Egypt, as well as 30 nasal swabs, obtained from health care workers. The minimum inhibitory concentrations (MICs) for MRSA isolates to mupirocin were assessed using E-test method and polymerase chain reaction (PCR) targeting *MupA* gene was performed.

Results: Using E-test, six isolates out of 60 MRSA (10%) exhibited high level resistance to mupirocin and only one isolate (1.6%) exhibited low level mupirocin resistance. Four isolates out of six MRSA that exhibited high level mupirocin resistance carried *MupA* gene. All seven isolates (11.6%) that showed mupirocin resistance were from nasal carriers. Compared to mupirocin-susceptible strains of MRSA, strains with mupirocin resistance strains were more likely to be resistant to tetracycline, chloramphenicol, gentamycin, ciprofloxacin and trimethoprim-sulfamethoxazole.

Conclusion: The prevalence of high-level mupirocin resistance (10%) and low-level resistance (1.6%) in MRSA in our institution is a cause for concern. Hence, it is recommended that routine testing of MRSA for mupirocin resistance be conducted even in facilities where mupirocin is not prophylactically administered.

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