

ABSTRACT

Due to increased demand of vancomycin on global scale for treating infections caused by MRSA, it has become essential to overcome its nephrotoxicity. Previous studies did not move towards herbal medicine for treating nephrotoxicity. In Pakistan, the current study investigated the positive potential of *Silybum marianum* (milk thistle) towards vancomycin induced nephrotoxicity. For study, two models were selected on which experimentation was conducted. One was Swiss albino mice and other was Vero cells. Five groups of Swiss albino mice were made. Two were control and other were vancomycin treated group (300mg/kg BW), milk thistle (400mg/kg BW) + vancomycin treated group (300mg/kg BW) (same time) and vancomycin (300mg/kg BW) + milk thistle (400mg/kg BW) treated group (different time). Serum analysis for creatinine and urea, histopathological studies of mice kidney and expression of *p53*, *p21*, *Cas-4*, *Cas-5* and *Cyt-c*, altogether showed destruction of kidney morphology and function and high oxidative stress due to vancomycin and recovery because of milk thistle to some extent. While on the other hand, Vero cells were treated with different concentration of vancomycin (0.6, 3 and 6mg/mL) and milk thistle (200, 100 and 400µg/mL) alone and in combination. The expression analysis of *p53*, *p21*, *Cas-4*, *Cas-5* and *Cyt-c* were checked by qPCR that confirmed vancomycin participate in the generation of oxidative stress and causes the upregulation of above mentioned genes in vancomycin group (V1,V2,V3) as compared to combined milk thistle and vancomycin group (T3-T11) and alone milk thistle group (T1,T2).