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Cardiac troponins and their predictive value of myocardial injury on model of chronic anthracycline cardiomyopathy

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Cardiac troponins seem to be more sensitive for the detection of anthracycline cardiotoxicity than the currently recommended method of monitoring LV systolic function. However, the optimal timing of blood sampling remains unknown. Hence, the aims of the present study were to determine the diagnostic window for cTns during the development of chronic anthracycline cardiotoxicity and to evaluate their predictive value. Cardiotoxicity was induced in rabbits with Daunorubicin (3 mg/kg, weekly, for 8 weeks). Blood samples were collected 2-168 hrs after the 1st, 5th and 8th drug administration, and concentrations of cTns were determined using highly sensitive assays: hs cTnT (Roche) and hs cTnI (Abbott). The plasma levels of cTns progressively increased with the rising number of chemotherapy cycles. While only a mild non-significant increase in both cTn levels occurred after the 1st Daunorubicin dose, a significant rise was observed after the 5th and 8th administrations. Two hours after these administrations, a significant increase occurred with a peak between 4-6 hrs and a decline until 24 hrs. While greater variability of cTn levels was observed around the peak concentrations, the values did not correspond well with the severity of LV systolic dysfunction. Unlike AMI in cardiotoxicity, cTn elevations may be better associated with cumulative dose and AUC than c_{max} . Very strong correlation between dp/dt_{max} and $AUC_{total5-10}$ (calculated from the 5th till the 10th week) for both cTnI and cTnT ($R=-0.857$, $p<0.01$ and $R=-0.833$, $p<0.01$; respectively) and LV FS ($R=-0.810$, $p<0.01$ and $R=-0.833$, $p<0.01$; respectively) were found.

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