

8th Global

Cardiologists & Echocardiography Annual Meeting

July 18-20, 2016 Berlin, Germany

Septic myocarditis is mainly due to cardiac failure without significant myocardial necrosis

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Background: Sepsis patients with myocardial injury have very high mortality (30-60%). Only a few studies incorporating electrocardiography, high sensitive troponin T (hsTnT), N-terminal pro-BNP (pro-BNP) and echocardiography has been conducted in these patients.

Methods & Results: Out of 204 patients with sepsis enrolled, 111 patients satisfied the inclusion criteria and 103 completed the study. Myocardial injury was defined by elevation of hsTnT > 25 pg/ml. Initial hsTnT, pro-BNP and 2D echocardiography were repeated if sepsis progresses. Primary and secondary end point was in hospital mortality and left ventricular dysfunction (LVD). Simple sepsis was diagnosed in 45%; 19% had septic shock and 36% developed severe sepsis. Male predominance (63%) was with majority being diabetic (66%) and above 50 years of age (54%). Sinus tachycardia was present in 65% and T inversion in inferior leads in 32%. Systolic dysfunction (SD) was present in 42%, diastolic dysfunction (DD) in 21% and 21% had both SD and DD. HsTnT was elevated in 84% of the patients. Both HsTnT and pro-BNP were significantly correlated with LVD ($p < 0.001$). Though pro BNP and HsTnT vary in different levels of LVD, variation was more marked with pro-BNP. Both levels were lesser in DD than SD. Grade III DD was always associated with severe SD. Pro-BNP had significant correlation with pro-calcitonin level ($p < 0.001$) and APACHE II score ($p < 0.001$); HsTnT had significant correlation only with APACHE II score ($p < 0.001$). CRP level did not have correlation with cardiac markers. In hospital mortality was 8%. In survivors hsTnT was 158pg/ml and pro-BNP was 6400 pg/ml. In non-survivors hsTnT was 256 pg/ml ($p < 0.047$) and pro-BNP was 21805pg/ml ($p < 0.001$). Pro BNP has better correlation with the survival. ROC curve showed that a pro-BNP level >8530 pg/ml signified with mortality (sensitivity-100% and specificity-80%) and HsTnT level >178pg/ml correlated with mortality with 88% sensitivity and 71% specificity. Base line creatinine was normal in all patients; 55% had elevated creatinine during the sepsis and had linear correlation with hsTnT level ($p < 0.01$).

Conclusion: Pro-BNP is a powerful tool for prognostication in sepsis with myocardial dysfunction and a value >8530 pg/ml signified decreased survival with 100% sensitivity. The significant elevation of pro-BNP with minimal elevation of hsTnT indicated that the patho-physiology is mainly myocardial stretch and not myocardial necrosis in sepsis; with full recovery in survivors.

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