

NT-proBNP Blood Levels after Axial Flow LVAD Implantation are Related to Pre-Implant Levels

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Background: Left ventricular assist devices (LVADs) reduce mortality and improve quality of life in appropriately selected patients. LVAD therapy decreases left ventricular wall stress and thus, its surrogate natriuretic peptide (NP) levels. Thus, one would anticipate that early post operative levels of NT-proBNP would decline in response to the reduced wall stress.

Methods: A retrospective analysis of the change in NT-proBNP (pg/ml) levels between admission and discharge after LVAD implant was conducted. Variables are described as medians and interquartile range (25%-75%).

Results: Of the 72 patients implanted with Heartmate II LVADs, 21 were to bridge to transplant. Baseline NT-proBNP levels were elevated at 5079 and highly variable (2232-12770). By discharge, NT-proBNP was markedly reduced at 3040 (2224-5563, $p=0.0005$) but was still 3.09 (1.73-5.33) times the calculated age based upper limit of normal. NT-proBNP at admission was correlated with NT-proBNP at discharge (Spearman correlation = 0.41, $p=0.0004$). Predictors of the change in NT-proBNP corrected for the admission value included pre-operative RV stroke work index ($\beta=-0.22$, $p=0.035$) and LVAD pulsatility index at discharge ($\beta=31.70$, $p=0.026$).

Overall, baseline levels decreased at discharge by 26% (-68% to 42%).

Conclusion: NTproBNP levels are markedly reduced in response to LVAD implantation but are still markedly elevated. These elevated levels may represent a chronic adaptation related severe pre-operative heart failure. Given the variation in levels, it is the trend and not the absolute values that should be followed.