Hypotension Prediction Index: Correlations between Invasive and Non-invasive Pressure Inputs

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The goals of this study are to: 1.) compare the reliability of the ClearSight system in predicting hypotensive events when compared with the gold standard, intra-arterial catheter monitoring system and 2.) increase clinician confidence in non-invasive hemodynamic monitoring and thus support the use of non-invasive monitoring whenever possible. For our project, we recorded patients' hemodynamics concurrently with both invasive (intra-arterial) and non-invasive (ClearSight) monitoring. Each monitoring system was connected to a Hemosphere monitor with the HPI software. Then, data collected from the ClearSight system was compared to corresponding intra-arterial waveform data using Pearson correlation analysis, Bland-Altman analysis, and analysis of concordance. We found the correlation between HPI values to be strong with an r value greater than 0.7. Bland-Altman analysis between ClearSight and intra-arterial HPI yielded a bias of -10.5 with limits of agreement +/- 46.4. Concordance was also strong at 72%. Moreover, we found similar results for 11 hemodynamic variables in total including CO, SV, MAP, SVV, etc. Overall, the ClearSight finger cuff presents as a promising monitoring system that compares well to the gold standard for hemodynamic monitoring with some drawbacks, including occasionally lacking reliability and producing significant noise. We plan to also generate error grid analysis plots for each hemodynamic variable to further shed light on the clinical utility of the ClearSight system for intra-operative monitoring.