

COMPARISON OF AMBULATORY BLOOD PRESSURE AND CENTRAL BLOOD PRESSURE PARAMETERS TO CLINIC BLOOD PRESSURES IN PATIENTS WITH CORONARY ARTERY DISEASE

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Purpose:

It has long been known that the conventional cuff-based method of measuring brachial systolic and diastolic pressures are not the best blood pressure (BP) parameters to predict illness and guide therapy. The purpose of this study is to determine the relationship between traditional office BPs and two newer BP measuring methodologies. These newer techniques are ambulatory blood pressure monitoring (ABPM) and Applanation Tonometry. ABPM increases the reproducibility of brachial BPs by increasing the number measurements taken, while also allowing the BP to be taken over a variety of daily situations. Applanation tonometry is a departure from traditional cuff based methods and allows the capturing of the entire BP waveform in a variety of arteries. Further, with the use of a transfer function, aortic pressure waveforms may be derived from the measured peripheral waveform. Aortic pressure may be a better indicator of the effect of hypertension treatment.

Method:

Patients above the age of 55 with hypertension and coronary artery disease who had been treated for at least one year were recruited from the Shands Cardiology Clinic in Gainesville, FL. Two traditional blood pressure measurements were taken by the cardiology clinic staff as part of their normal cardiology visits. Applanation tonometry readings were taken on the subjects at the radial artery in a seated position. Two readings with an internal quality rating of 80 were taken. The subject then wore an ambulatory blood pressure monitor for twenty-four hours at a frequency of every thirty minutes. Daytime, nighttime, and 24 hour ambulatory pressures were compared to clinic blood pressures. Tonometry derived central blood pressures were also compared to clinic blood pressures.

Findings:

Ambulatory blood pressures were not significantly different from clinic blood pressures. (Diastolic pressure was statistically, but not clinically significant.) Central systolic and pulse pressures (PP) were both significantly different and displayed a highly linear relationship with their respective clinic pressures. (SBP 10 ± 2 mmHg; $r=.952$, $p<.0001$; PP 11 ± 2 mmHg; $p<.0001$) Central diastolic pressures were not significantly different from clinic pressure.

Discussion:

The ambulatory blood pressure findings, while contradicting the findings of many studies is corroborated by a small number of studies that shows that when care is taken in clinic BP methodology, ABP and clinic pressures are very similar. The highly linear differences between central SBP, PP and clinic pressures has previously been reported in the literature and is expected given the age of the study population. The implication is that in elderly populations, the central blood pressure may be derived simply by taking the SBP and PP and subtracting 10.