# Baseline Drifting Removal Affects Microvolt T-Wave Alternans Measurement

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Microvolt T-Wave alternans (MTWA) is a beat-to-beat alternation of T-wave amplitude and is considered an early marker of sudden cardiac death. ECG signal for the MTWA test is susceptible to noise due to instrumentation. It is expected that baseline drifting and other interferences to contaminate the signal, thus, pre-processing is required. Baseline drifting removal by a fitting spline function is one of the most used techniques in pre-processing ECG signals for MTWA assessment. This work estimates the impact of these approaches in MTWA assessment for real-world signals. The classical approach estimates a baseline signal using ECG fiducial points and subtracts it from the original signal. The MTWA is assessed by assembling a vector of T-wave amplitudes using the maximum value of a T-wave search window (CAV -classical approach vector). An alternative method to assess the T-wave amplitude is proposed to avoid baseline drifting removal, by using the amplitude difference between the T-wave end and the T-wave peak (AAV - alternative approach vector). The alternans spectrum in each case was calculated by the FFT. The alternans peak (harmonic at half cycle per beat) and the ten consecutive harmonics in the alternans peak neighborhood were used to calculate the alternans ratio (defined as alternans peak divided by the standard deviation of the 10 neighbor harmonics). The alternans spectrum from both T-wave amplitude vectors were compared by coherence analysis using the Fisher transform. The analysis at the alternation frequency showed statistically significant coherence between the AAV and CAV spectra (average 0.54). The alternans peak and alternans ratio for AAV were both higher than CAV. The current findings indicate that the CAV may add processing artifacts that interfere in MTWA oscillation and partially masks MTWA analysis, as compared to AAV.
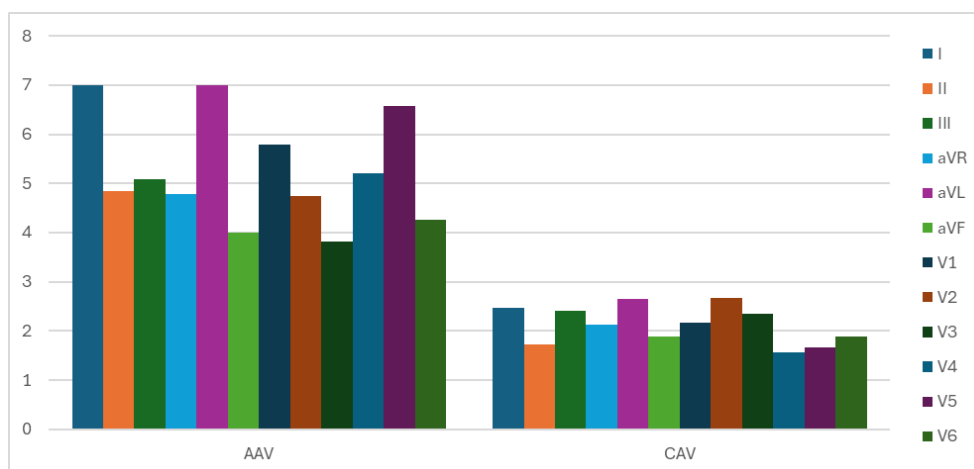
Alternans Ratio for MTWA assessment methods, for each lead, in both methods. No mean AR was higher than 3,0 for CAV.