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Chronic Disease Related Decline of Resting Autonomic Function Shows Gender-Based Aging Differences

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Background: Published time domain heart rate variability based measures of autonomic function in healthy subjects shows that resting autonomic function differs between the genders. Spectral analyses of respiration with spectral analysis of heart rate variability show similar trends. **Methods:** Serial autonomic function testing (ANX-3.0, Ansar, Inc., Philadelphia, PA) was performed on 5752 subjects, including 92 normal subjects (ages 7 to 88) in 38 ambulatory clinics nationwide. The 15.5' test clinical exam included a 5' resting baseline. The average autonomic indices from the resting baseline were analyzed as markers of resting autonomic function. Patients with arrhythmia (more than 10 ectopic beats during the exam) were omitted, leaving 4204 patients (2530 females, 2310 hypertensives, 1613 diabetics, 953 patients with congestive heart failure, 331 Parkinson patients). There were 537 patients younger than 30, 1686 patients between 30 and 55, and 2691 patients over 55, including 776 patients over 75. Statistical Analyses included fourth-order polynomial trend analysis of resting sympathetic and parasympathetic function, and sympathovagal balance. **Results:** The total population data for the resting sympathetics (LFa: low frequency area), parasympathetics (RFa: respiratory frequency area), and sympathovagal balance (Balance: LFa/RFa) are presented in two scatter plots against age. Added to the scatter plots are the trend lines for the data and the averages from the tested healthy subjects (triangles). The regression curves show that average resting sympathetic and parasympathetic function is reduced as compared to the healthy data until about age 60. The healthy balance averages are lower than the average patient data indicating that patients, on average, present with greater sympathetic function. In healthy subjects balance decreases from greater than 1.0 to less than 1.0 around age 50, indicating more parasympathetic activity. Disease (hypertension, diabetes, heart failure, or Parkinson's) specific effect analyses show no significant differences. Gender effects show that younger females have higher resting sympathetic function than younger males. During mid-life the differences become insignificant and an inversion occurs between ages 50 and 60. Older females end up with higher resting parasympathetic function. **Conclusion:** Resting autonomic is depressed due to all diseases. Specific disease effects are not significant. Gender effects are significant and similar to published Holter results. The current data also show an upturn in AF later in patients' life, also similar to published Holter data.

