

Age-adjusted normal confidence intervals for heart rate variability in healthy subjects during head-up tilt. Piccirillo G, Fimognari FL, and other. Int J Cardiol. 1995 Jun 30;50(2):117-24.

PURPOSE: Aging leads to a decline in autonomic nervous system function. In this study, designed to assess the influence of age on neuroautonomic regulation of cardiac activity, heart rate variability was measured by power spectral analysis and normal ranges were determined in a population of healthy subjects. PATIENTS AND METHODS: In 83 healthy volunteers (42 men and 41 women; age range 25-85 years) autonomic nervous system function was assessed by autoregressive spectral analysis of heart rate variability in clinostatism and after passive orthostatic load (head-up tilt). The analysis considered two spectral components relevant to the study of the autonomic nervous system--high-frequency power (approximately 0.05 Hz) and low-frequency power (approximately 0.10 Hz)--and the ratio between them. Low-frequency spectral components, in particular the ratio between low- and high-frequency spectra, reflect sympathetic activity; high-frequency components reflect parasympathetic activity. RESULTS: For data comparison, the study group was subdivided into three age groups: 25 subjects (12 men and 13 women) under 44 years of age; 28 (15 men and 13 women) aged 44-64 years; and 30 (15 men and 15 women) over 64 years of age. The natural logarithms and normalized units of low- and high-frequency power, and the low-to-high power ratio were used to calculate 95% confidence intervals. Power spectral analysis at baseline and after postural tilt showed significantly higher low-frequency power of heart rate variability ($P < 0.05$), natural logarithm of power ($P < 0.001$) and normalized units ($P < 0.001$) in the two younger groups than in the oldest group. The two younger age-groups also had significantly increased high-frequency power ($P < 0.05$) and natural logarithm of power ($P < 0.05$). The oldest age group had significantly increased high-frequency power analyzed in normalized units ($P < 0.001$). CONCLUSION: The age-related lowering observed in nearly all the spectral frequency components of heart rate variability confirms in healthy subjects that autonomic nervous system function declines with age.