

Heart rate variability in healthy subjects: effect of age and the derivation of normal ranges for tests of autonomic function. O'Brien IA, O'Hare P, Corrall RJ. Br.Heart J. 1986 Apr;55(4):348-54.

The diagnosis of autonomic neuropathy frequently depends on results of tests which elicit reflex changes in heart rate. Few well-documented normal ranges are available for these tests. The present study was designed to investigate the effect of age upon heart rate variability at rest and in response to a single deep breath, the Valsalva manoeuvre, and standing. A computerised method of measurement of R-R interval variation was used to study heart rate responses in 310 healthy subjects aged 18-85 years. Heart rate variation during each procedure showed a skewed distribution and a statistically significant negative correlation with age. Normal ranges (90% and 95% confidence limits) for subjects aged 20-75 years were calculated for heart rate difference (max-min) and ratio (max/min) and standard deviation (SD). Heart rate responses were less than the 95th centile in at least one of the four procedures in 39 (12.6%) out of the 310 subjects, and were below this limit in two or more tests in five (1.6%) subjects. In view of the decline in heart rate variation with increasing age, normal ranges for tests of autonomic function must be related to the age of the subject.