

## Cycle Length Dependency of Heart Rate Variability in Elderly with Ischemic Heart Disease

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Low heart rate variability (HRV) is considered as a marker of coronary disease (CD). However, HRV also decreases with normal aging, reaching levels as low as those seen with CD. This limits the predictive utility of HRV. Cycle length dependency (CLD) of HRV has been proposed as an additional discriminator. To test the possibility that differences in CLD could help distinguish low HRV due to normal aging from that due to disease, we computed HRV for different CLs in 24 hr Holter records from 65 subjects (~ 65 yrs): 1) 37 healthy subjects (mean = 75 yrs); 2) 17 single vessel CD patients (mean = 74 yrs) and 11 multi-vessel CD patients (mean = 74 years). Mean RR interval, Standard Deviation Index (SDI), root mean square of successive differences (rMSSD) and % difference in successive RR intervals > 50 msec (pRR50), were computed for consecutive 5 min periods. Periods with comparable mean RR interval were grouped in 100 msec bins. Mean SDI, rMSSD and pRR50 were calculated for each bin for each subject. Mean values for each CL were determined for each group. Inter- and intra-group HRV differences at CL 500-1100 msec were evaluated using ANOVA and paired t-test. The results show: 1) SDI of group 1 (45 msec) differed significantly from that of group 3 (31 msec). However, SDI of groups 1 (45 msec) and 2 (39 msec) did not differ; 2) rMSSD and pRR50 did not differ significantly among the 3 groups; 3) In group 1, CLD of SDI persisted at 500-700 msec; rMSSD at 900-1100 msec; and pRR50 at 800-1100 msec. In contrast, CD patients (groups 2 and 3) did not exhibit CLD irrespective of the measures used. In conclusion: 1) Both low HRV and absent CLD distinguish healthy elderly from elderly multi-vessel CD patients; 2) Diminished and absent CLD, but not low HRV, also appear to distinguish healthy elderly from 1 vessel CD patients.