Biochemistry, 2Department Med., Grad. School
Ht 0.1 -0.1
IVS thickness
p<0.05) all generally decreased throughout 24 hours. 3)HF (231.096M43.606 between 1st and 2nd recordings: O:OO-4:00,8:00-9:00,10:00-13:00, 17:00
ues throughout 24 hours in 15 subjects: 1st vs 2nd recording= 0.993&0.110 variability(HRV) and its circadian rhythm(CR) in the very elderly.
protein (CRP), interleukin-6 (IL-6), hematocrit, hemoglobin, urea and creati-
chronic renal failure hemotocrit, creatinine, and indices of chronic inflammation, Like CRP and IL-6, are variables deter-
mining autonomic tone, in addition to previously reported variables such as age, diabetes and left ventricular function.

P-193 LONG-TERM CHANGES IN HEART RATE VARIABILITY AND ITS CIRCADIAN RHYTHM IN VERY ELDERLY SUBJECTS
Objectives: We assessed the longitudinal age-related changes in heart rate variability(HRV) and its circadian rhythm(CR) in the very elderly.
Methods: In 15 healthy elderly subjects (mean age of 70.0±4.1, 64–80 y.o.; at 1st recording, female 10) in whom Holter monitorings were conducted twice at an interval of 15 years, we assessed changes in HRV (meanNN, HF, LF, LF/HF) and its CR.
Results: (I) Changes in 15 years: 1)meanNN(Comparison of total values throughout 24 hours in 15 subjects: 1st vs 2nd recordings: 0.993±0.110 sec vs 0.918±0.125, p<0.003; Time of the day with significant change between 1st and 2nd recordings: 0:00–4:00,8:00–9:00,10:00–13:00, 17:00 –20:00, p<0.003; 2)HF/LF (1.6±0.72 vs 0.943±0.452, p<0.005; 2:00–10:00,3:00–15:00,17:00–20:00, p<0.05 and LF/HF (285.500±197.650 msec vs 181.351±144.368, p<0.003; 2:00–5:00,11:00 –12:00,21:00–24:00, p<0.05) all generally decreased throughout 24 hours. 3)HF (221.096±143.606 msec vs 326.724±331.645, p=0.1125; 5:00–7:00,17:00–18:00, p<0.05) showed increased tendency throughout 24 hours. (II) Circadian patterns: Both meanNN and LF/HF at first and 2nd recordings and HF at 2nd recording showed relatively clear circadian patterns.
Conclusions: In healthy very elderly subjects, age-related changes in HRV as descriptors of cardiac autonomic input still appeared throughout 24 hours. The maximum changes within the CR of HRV appeared in the morning hours with increased age.

P-194 DETERMINANTS OF HEART RATE VARIABILITY IN CHRONIC RENAL DISEASE PATIENTS
S.N. Psychali, L. Sinos, G. Liakos1, E. Hamodraka, K. Filiz, C. Iatrou2, Th.S. Apostolou. 2nd Department of Cardiology, 1Department of Biochemistry, 2Department of Nephrology, Nikaia General Hospital, Athens, Greece
Backgrounds: Patients with renal disease have a high prevalence of autonomic dysfunction due to uremic autonomic neuropathy, that is associated to inadequate blood pressure control, intolerance to dialysis and poor prognosis.
Aim: To evaluate clinical and laboratory determinants of autonomic function, using heart rate variability as a marker of autonomic tone.
Methods: Prospective study of 50 patients with chronic renal disease, who were on sinus rhythm and had no recent infection, or acute myocardial ischemia. All patients had a 24 hour ECG recording for heart rate variability analysis, an echocardiogram and blood sample testing for lipids, C-reactive protein (CRP), interleukin-6 (IL-6), hemocrit, hemoglobin, urea and creati-
Correlation of variables with HRV

<table>
<thead>
<tr>
<th>Correlation of variables with HRV</th>
<th>SDNN</th>
<th>RMSSD</th>
<th>pNN50</th>
<th>TP</th>
<th>LF</th>
<th>HF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-0.8</td>
<td>0.2</td>
<td>-0.1</td>
<td>-0.4</td>
<td>p&lt;0.05</td>
<td>-0.5</td>
</tr>
<tr>
<td>Diabetes</td>
<td>-4.5</td>
<td>2.1</td>
<td>0.05</td>
<td>3.4</td>
<td>5.8</td>
<td>1.0</td>
</tr>
<tr>
<td>Ht</td>
<td>0.1</td>
<td>-0.1</td>
<td>-0.4</td>
<td>0.3</td>
<td>0.03</td>
<td>0.3</td>
</tr>
<tr>
<td>IL-6</td>
<td>0.02</td>
<td>0.5</td>
<td>0.5</td>
<td>-0.0</td>
<td>0.2</td>
<td>0.4</td>
</tr>
<tr>
<td>CRP</td>
<td>-0.2</td>
<td>0.3</td>
<td>-0.4</td>
<td>-0.0</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>CR</td>
<td>0.05</td>
<td>-0.02</td>
<td>-0.01</td>
<td>-0.05</td>
<td>0.3</td>
<td>-0.09</td>
</tr>
<tr>
<td>HF</td>
<td>0.2</td>
<td>0.07</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.2</td>
</tr>
<tr>
<td>IJSV thickness</td>
<td>-0.3</td>
<td>-0.2</td>
<td>-0.2</td>
<td>0.03</td>
<td>0.5</td>
<td>-0.2</td>
</tr>
<tr>
<td>LVDD</td>
<td>-0.3</td>
<td>-0.1</td>
<td>-0.1</td>
<td>-0.4</td>
<td>-0.4</td>
<td>-0.2</td>
</tr>
</tbody>
</table>

The above results suggest that the incidence of non-sVT in the 15-minute windows, throughout one hour before the onset of non-sVT and also between the one-hour windows analyzed for two hours prior to the onset of non-sVT. Antiarrhythmic drugs did not affect HRV indices with any statistical significance.
Conclusion: The above results suggest that the incidence of non-sVT in CAD pts with depressed left ventricular function is triggered by autonomic substrate abnormalities, and not by changes in autonomic cardiac regulation.

P-195 LINEAR AND NON-LINEAR INDICES OF HEART RATE VARIABILITY PRECEDING NON SUSTAINED VENTRICULAR TACHYCARDIA IN PATIENTS WITH CORONARY ARTERY DISEASE AND DEPRESSED LEFT VENTRICULAR FUNCTION
G. Gorantzas, A. Charalabakis, S. Benekatos, N. Kouris, D. Babalis. Cardiology Department, West Attiki General Hospital, General Secretariat of Research and Technology, Athens, Greece
We examined whether linear and non-linear indices of heart rate variability (HRV) could reveal changes in neural cardiac activity, which might predispose to the incidence of non-sustained ventricular tachycardia (non-sVT) in coronary artery disease patients (CADpts) with depressed left ventricular function.

Methods: A total of 24 episodes of non-sVT (more than four impulses duration<30sec) with mean cycle 389±84 msec, were examined in 17 CAD pts with LVEF<30% on Holter recordings. 50% of the patients were in b-blocker and 30% were in amiodarone therapy. HRV analysis was performed on windows of 15-minutes duration, for one hour preceding the incidence of non-sVT episodes and on windows of 1 hour-duration for two hours prior to them. We measured the standard indices of HRV of mean RR, SDNN, Lf, Lf/Hf, and Lf, Hf, and the non-linear indices of DFA a1 exponent, and lyapunov exponent. ANOVA for repeated means and paired samples t-test were used for statistical analysis.
Results: HRV did not demonstrate any statistically significant differences among the 15-minute windows, throughout one hour before the onset of non-sVT, and also between the one-hour windows analyzed for two hours prior to the onset of non-sVT. Antiarrhythmic drugs did not affect HRV indices with any statistical significance.
Conclusion: The above results suggest that the incidence of non-sVT in CAD pts with depressed left ventricular function is triggered by autonomic substrate abnormalities, and not by changes in autonomic cardiac regulation.

P-196 HEART RATE VARIABILITY INDICES IN CORONARY HEART DISEASE PATIENTS WITH INDUCTIBLE SUSTAINED VENTRICULAR TACHYCARDIA
G. Gorantzas, A. Charalabakis, S. Benekatos, D. Babalis. Cardiology Department, West Attiki General Hospital, General Secretariat of Research and Technology, Athens, Greece
We examined whether standard and non-linear indices of heart rate variability (HRV) could predict sustained monomorphic ventricular tachycardia (smVT) inducible with electrophysiologic study (EPS) in coronary heart disease patients (CHDpts).

Methods: Standard measures of HRV (SDNN, Lf, Lf/Hf, Lf/Lf, Lf/Lf) and non linear indices of HRV (DFA exponents a1 and a2, lyapunov exponent, approximate entropy and power law exponent β of the power spectra between 0.0001 to 0.01 Hz) were measured from 24hour electrocardiographic recordings, in the following three groups: Group A consisted of 17 CHDpts, mean LVEF=31±6%, who developed inducible smVT with EPS, group B consisted of 26 CHDpts, mean LVEF=50.7±8.6%, with spontaneous or inducible smVT and group C consisted of 20 age-matched healthy subjects. HRV indices were calculated in segments of 12000 R-R intervals and then averaged for the entire 24-hour period.

Results: Groups A and B showed statistically significant lower values compared with group C in the following HRV indices: DFA exponent a1 (p<0.004), lyapunov exponent (p<0.005), SDNN (p<0.0001), Lf (p<0.01), Lf/Lf (p=0.001), Lf (p<0.0001) and Lf (p<0.03). Between groups A and B, only exponent a1 and lyapunov exponent differed significantly (exponent a1: groupA=0.74±0.12, groupB=0.90±0.27, p<0.05, lyapunov exponent: group A=0.58±0.01, groupB=0.63±0.004 p<0.05). The cut off point values of DFA exponent a1 <0.83 and of lyapunov exponent <0.058 were found to have sensitivity 78% and 72% and specificity 60% and 78% respectively, in differentiating groups A, B. DFA exponent a1 showed moderate correlation with