

Heart rate turbulence and heart rate variability in patients with diabetes mellitus

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Introduction: Heart rate variability (HRV) and heart rate turbulence (HRT) illustrate regulation of the heart by autonomic nervous system. Diabetic autonomic neuropathy is a serious and common complication of diabetes. The aim of our study was to determine the association between HRT, HRV and diabetes control monitored by HbA_{1c} measurement.

Material and methods: In 56 patients with diabetes mellitus t. 2 (36 men and 20 women, aged 48–75 years), 24-hour ECG Holter monitoring was performed to evaluate time domain HRV parameters (SDNN, SDNNI, SDANN, rMSSD, pNN50) and HRT parameters (TO and TS). Regression analysis was performed to evaluate the association between tested parameters.

Results:

| HRV parameter | Value | Correlation Coefficient with TO | Correlation Coefficient with TS | Correlation Coefficient with HbA _{1c} |
|---------------|----------|---------------------------------|---------------------------------|------------------------------------------------|
| SDNN | 130 ± 33 | r = -0.33 | r = 0.52 | r = -0.12 |
| | | p = 0.005 | p < 0.001 | p = NS |
| SDNNI | 46 ± 16 | r = -0.21 | r = 0.48 | r = -0.14 |
| | | p = 0.01 | p = 0.003 | p = NS |
| SDANN | 122 ± 29 | r = -0.26 | r = 0.42 | r = -0.12 |
| | | p = 0.003 | p < 0.001 | p = NS |
| rMSSD | 31 ± 13 | r = -0.12 | r = 0.36 | r = -0.18 |
| | | p = NS | p = 0.005 | p = NS |
| pNN50 | 9 ± 8 | r = 0.14 | r = 0.32 | r = -0.16 |
| | | p = NS | p = 0.005 | p = NS |

| HRT parameter | Value | Correlation coefficient with HbA _{1c} |
|---------------|------------|------------------------------------------------|
| TO | -1.1 ± 1.4 | r = 0.18, p = NS |
| TS | 12.1 ± 9.5 | r = -0.12, p = NS |

We observed significant correlation between TO and SDNN, SDNNI and SDANN. TS correlated significantly with SDNN, SDNNI, SDANN, rMSSD, pNN50.

We noted no correlation between HbA_{1c} and HRV or HRT parameters.

Conclusions: HRV time domain parameters correlate with HRT in patients with diabetes mellitus. Diabetes control estimated on basis of HbA_{1c} value did not show correlation with HRV and HRT.

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