
Diminished Cardiac Vagal Tone in Schizophrenia: Associations to Brain Laterality and Age of Onset

Dolores Malaspina, Gerard Bruder, Gregory W. Dalack, Stephen Storer, Marleen Van Kammen, Xavier Amador, Alexander Glassman, and Jack Gorman

We measured high-frequency (rapid) heart rate variability (HRV) from 24-hour Holter electrocardiograms to index cardiovagal tone in 23 patients with DSM-III-R schizophrenia or schizoaffective disorder. High-frequency HRV, quantitated by measuring the percent of successive normal interbeat intervals greater than 50 msec (PNN50), demonstrated a bimodal distribution: 11 of 23 patients had a PNN50 of ≥ 8.0 (mean value = 17.7 ± 11.0), and 12 had a PNN50 of ≤ 4.0 (mean value = 1.8 ± 1.0); no subject had a PNN50 value between 4.0 and 8.0. All 12 low cardiovagal tone patients (versus only 6/11 of the other patients) had a schizophrenia (not schizoaffective) diagnosis ($p = .013$). PNN50 was not associated with present age, gender, smoking, IQ scores, or symptomatology, but patients with lower cardiovagal tone did have a significantly later age of onset (20.5 ± 5.3 vs. 14.8 ± 2.8 years: $p = .005$). PNN50 subgroups also differed on dichotic listening measures of brain laterality. The low group failed to show left ear (right hemisphere) advantage for complex tones seen in the other patients and normal adults. They also showed larger right ear (left hemisphere) advantage for dichotic words than the other patients. This evidence of relative right hemisphere disadvantage in patients with low cardiovagal tone is consistent with findings linking autonomic nervous system and right hemisphere function. These findings also support the existence of subgroups of schizophrenia patients differing in autonomic activity, brain laterality, and clinical features. © 1997 Society of Biological Psychiatry

Key Words: Schizophrenia, cardiac, HRV, laterality, ANS, age of onset

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Introduction

A significant proportion of patients with schizophrenia have abnormalities in autonomic nervous system (ANS) function. These measures reflect the balance and interplay

of the sympathetic and parasympathetic nervous systems. Abnormalities in electrodermal activity, heart rate, pupil reactivity, vascular activity, and orienting responses to novel stimuli have been identified in up to 50% of schizophrenia patient samples. Research efforts in the field have focused