Autonomic nervous system abnormalities may predict cardiovascular changes after initiation of siponimod in the treatment of secondary progressive multiple sclerosis

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Objective: The aim of this study was to identify whether autonomic nervous system (ANS) dysfunction identified prior to treatment initiation can predict siponimod related decrease in heart rate (HR) after treatment initiation.

Methods: In 26 people with secondary progressive multiple sclerosis (SPMS) the following ANS testing protocol was applied: 10-min supine resting position, Valsalva maneuver, deep breathing test, 10 min tilt-up table test, 5-min supine resting period, ingestion of siponimod, followed by 180-min supine resting period recordings. Heart rate variability (HRV) parameters were investigated as possible predictors of decrease in HR (ΔHR) after treatment initiation.

Results: After treatment initiation, there was a statistically significant drop in HR (71.1±9.2 to 66.3±8.1, $p<0.001$) and elevation of systolic blood pressure (sBP) (113.2±12.4 to 117.1±10.8, $p=0.04$). Values of the diastolic BP (dBP) followed similar trend as did sBP, however not reaching statistical significance (72.8±9.6 to 74.9±8.3, $p=0.13$). In a multivariable regression model, disease duration and standard deviation of NN intervals (SDNN) were identified as independent predictors for ΔHR, where increase in SDNN and longer disease duration predict smaller ΔHR.

Conclusion: ANS abnormalities may predict cardiovascular abnormalities associated with treatment initiation with siponimod. Results of this study may help mitigate risks associated with siponimod treatment.