

Assessment of blood pressure and heart rate variability in Multiple Sclerosis

Fatemeh Shirbani, Edward Barin, Mark Butlin, Alberto P Avolio.

Faculty of Medicine and Health Sciences, Macquarie University, Sydney, Australia.

Introduction

- Reported cardiovascular autonomic dysfunction prevalence in Multiple Sclerosis (MS) varies between studies.
- As cardiovascular autonomic dysfunction lowers quality of life and may contribute to sudden death in MS, early cardiovascular autonomic dysfunction detection may assist treatment and risk identification.

Methods

- 23 MS patients and age and gender matched controls (38±12 years, 15 female) were studied.
- Continuous electrocardiogram and finger blood pressure were non-invasively acquired during 5 minutes supine rest.
- Heart rate variability (HRV) and systolic blood pressure variability (SBPV) quantified in the low frequency (LF: 0.04-0.15 Hz) and high frequency (HF: 0.15-0.5 Hz) ranges.
- Baroreceptor sensitivity (BRS) was quantified through sequence and coherence (α -LF & α -HF) analysis (Figure 1).

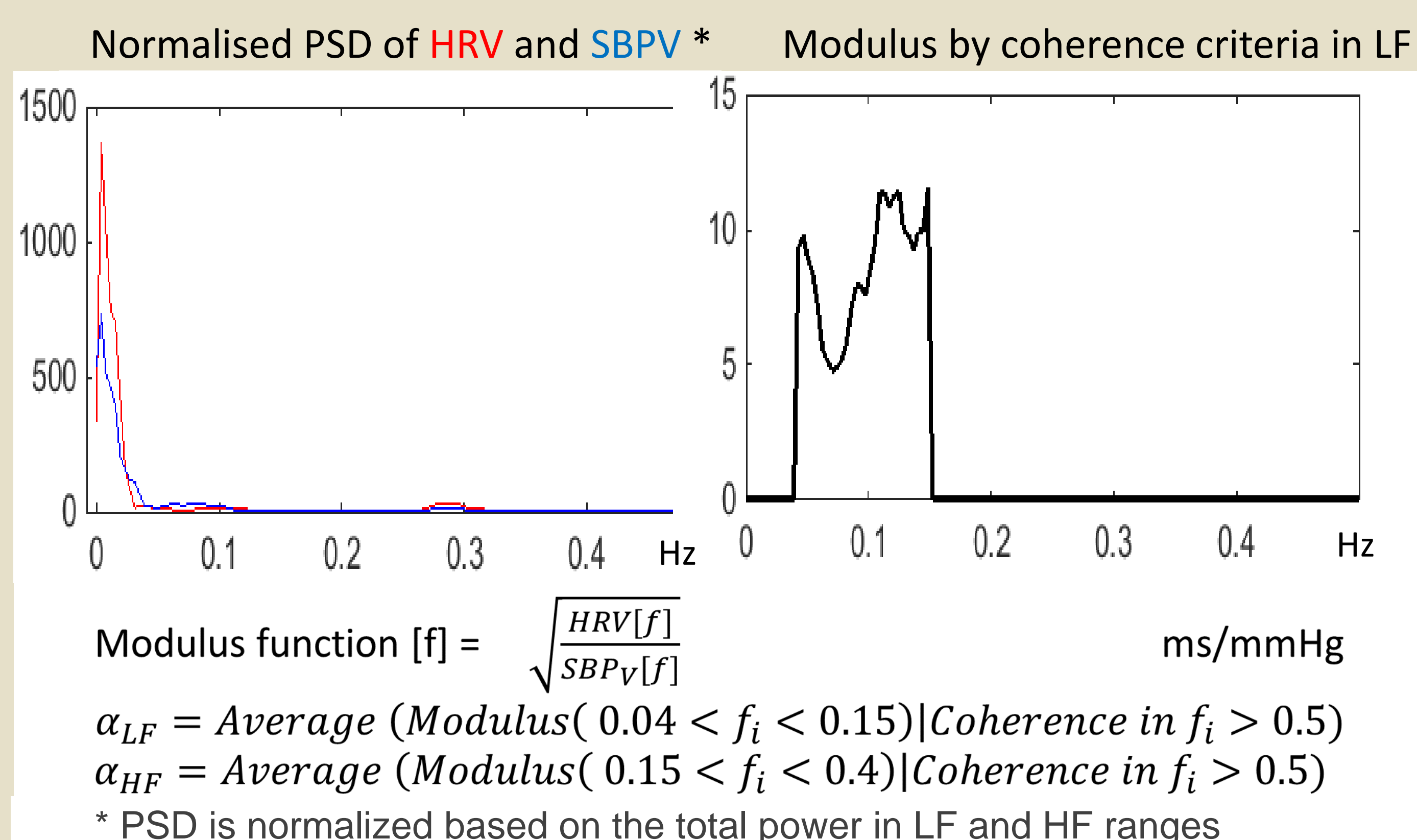


Figure 1. Power spectrum density (PSD) of heart rate variability (HRV) and systolic blood pressure variability (SBPV) and the modulus of coherence (α). Coherence was measured in the low frequency (LF) and high frequency (HF) range.

Results

- HRV did not differ between the groups.

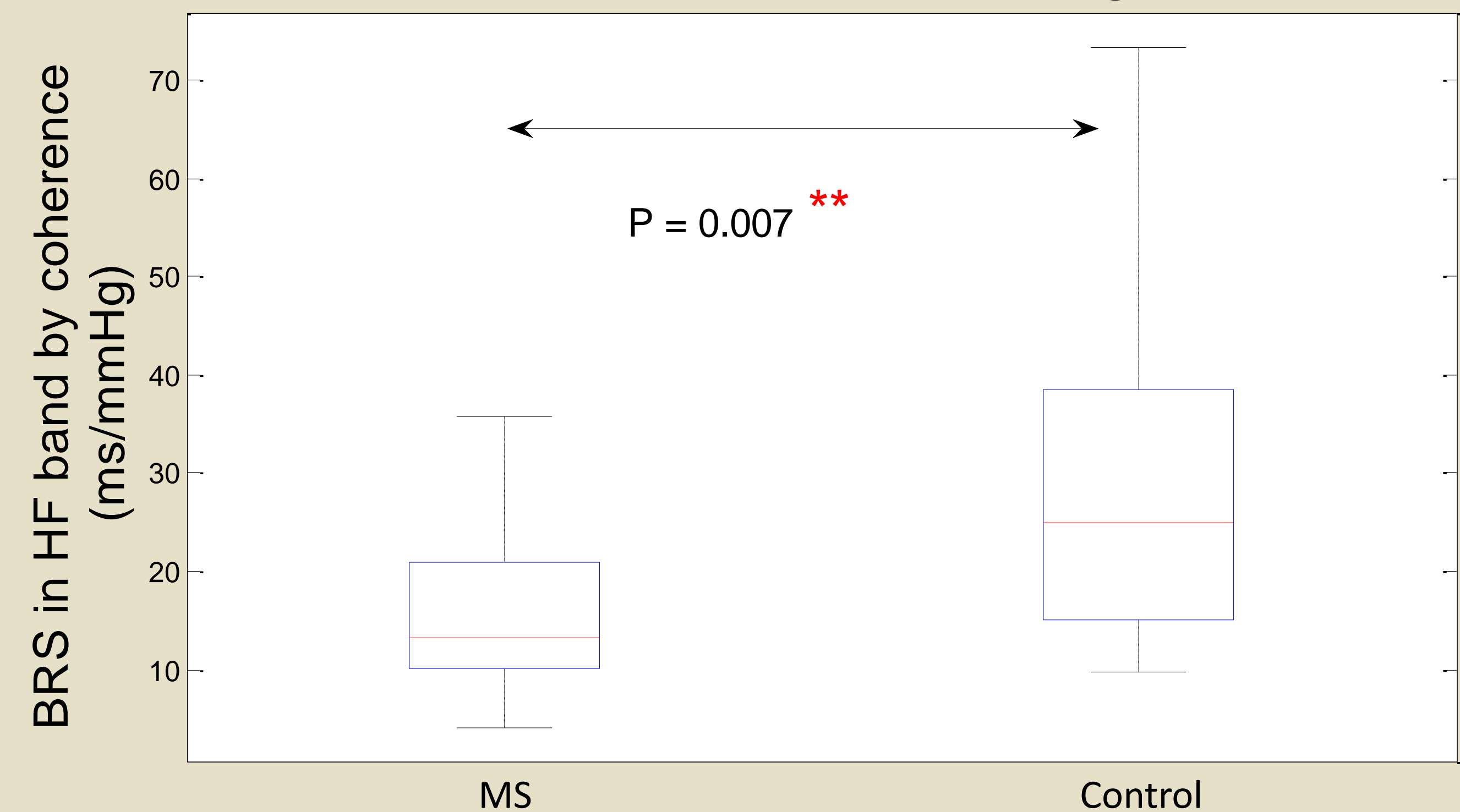


Figure 2. BRS in the high frequency band was lower in MS than control (22±13 and 39±25 ms/mmHg, p=0.007).

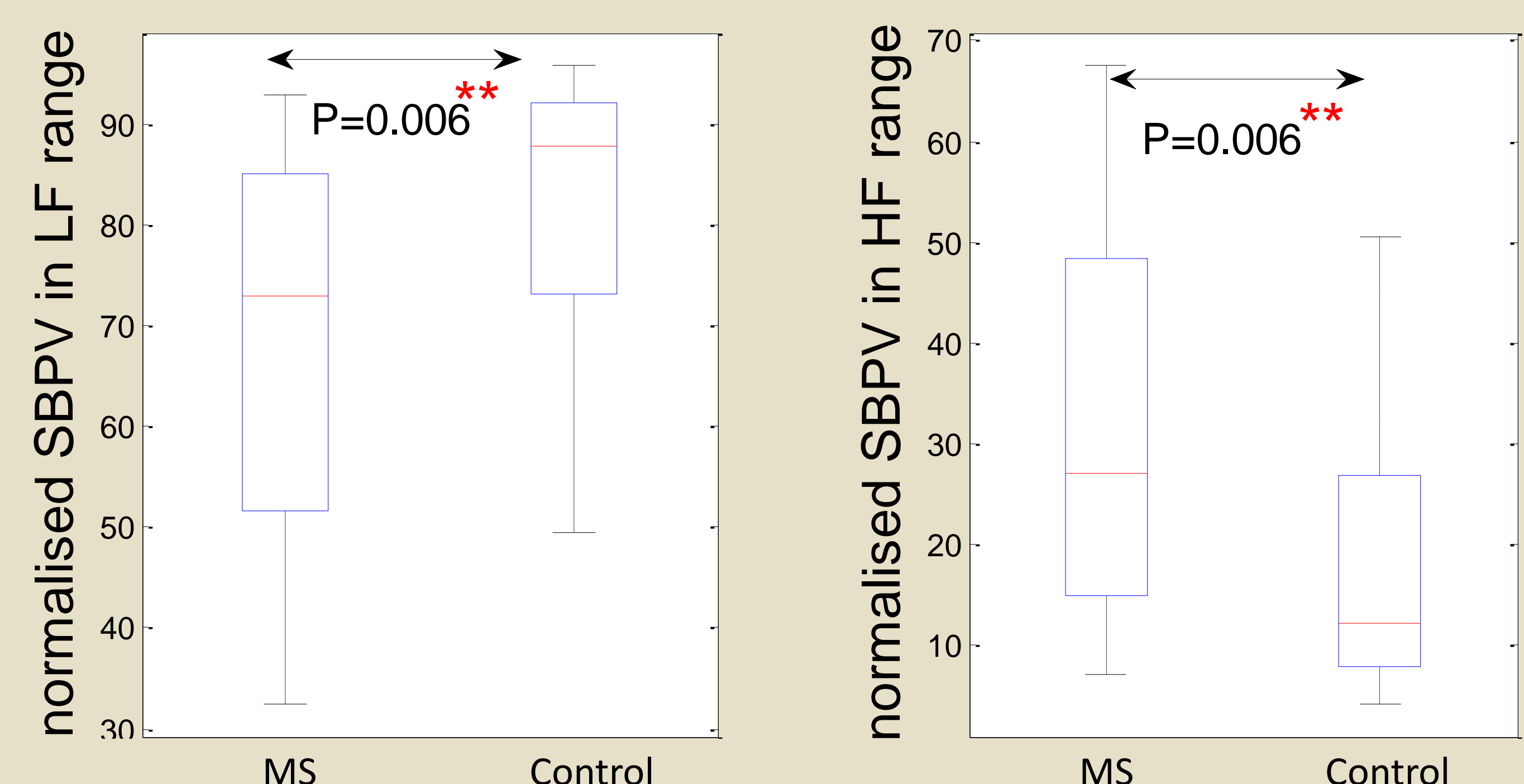


Figure 3. Normalised low frequency SBPV in the LF range was lower in MS subjects. Normalised high frequency SBPV in the HF range was greater in MS subjects.

Conclusions

- Differences in HF SBPV suggest differences in respiratory feedback.
- Differences in LF SBPV indicate differences in baroreceptor and/or chemoreceptor cardiovascular control.
- Difference in HF BRS indicates less BRS control in MS subjects.
- MS subjects have altered degree of cardiovascular autonomic control to healthy subjects and the effect of the respiratory pathway warrants further investigation.