

# Analysis of Autonomic Modulation Alterations in Chronic Shoulder Pain: Preliminary Results



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## Background

Heart Rate variability (HRV), Blood Pressure Variability (BPV) and Spontaneous Baroreflex Sensitivity (SBS) are possible indication of flexible and adaptive regulation in the presence of aversive stimuli, such as pain. When rapid vagal modulation of cardiac function is decreased, the organism is less able to track rapid changes in the environment and respond appropriately to the stimulus.



10 minutes



Finometer Pro

We used the low frequency in HRV and BPV analysis. In the SBS we used the sequence method also presents the baroreflex effectiveness index (BEI).

## Aim

This study aimed to compare HRV, BPV and SBS at baseline between the chronic shoulder pain (CSP) and pain-free control (PFC) groups.

## Methods

Research Ethics Committee CAAE: 67931623.6.0000.5414.



People with chronic shoulder pain and pain free control; >18 years

Continuous intake of medication, high levels of sports activities, and smoking habits



## Results

MANOVA showed that there is an effect of HRV, BPV, and SBS on the supine position among the [Pillai's Trace= 0.45184; F (3, 21) = 5.7699; p<0.001]. Univariate ANOVAs showed that there is an effect of SBS on different groups [F(1, 23)=11.316;p<0.001].

## Relevance to Patient Care

HRV, BPV and SBS provide measures that reflect the threat. The perception of threat is fundamental to evaluate the perceived danger to the organism, and the evaluation of fear related to movement through HRV can be a way to understand the mechanisms associated with the chronicity of pain in people with chronic shoulder pain.

**Table 1. Characteristics, heart rate variability, blood pressure variability, and spontaneous baroreflex sensitivity in groups (n=24)**

Characteristics	CSP group (n = 12)	PFC group (n=12)
Age (years), mean (SD)	43.2 (14.5)	27.4 (3.1)
female, n (%)	10 (83.4%)	10 (83.4%)
male, n (%)	2 (16.6%)	2 (16.6%)
HRV Variance, mean (SD)	2871.0 (2239.6)	5358.4 (7036.2)
LF/HF n.u., mean (SD)	1.2 (0.7)	1.2 (1.0)
LF n.u., mean (SD)	50.2 (14.3)	46.2 (17.6)
HF n.u., mean (SD)	49.7 (14.3)	53.7 (17.6)
BPV Variance mmHg <sup>2</sup> , mean (SD)	28.3 (19.3)	29.2 (16.4)
BEI (ms/mmHg), mean (SD)	0.4 (0.1)	0.6 (0.1)

HF, high frequency; LF, low frequency; BEI, baroreflex effectiveness index; ms<sup>2</sup>, milliseconds; nu, normalized units; SD, standard deviation; HRV, heart rate variability; BPV, blood pressure variability; BEI, baroreflex effectiveness index.

## Conclusion

Participants with CSP exhibited autonomic modulation alterations, expressed by decreased values of baroreflex sensitivity, but not by differences in heart rate and blood pressure variability.

## Conflict of Interest

The authors declare no conflict of interest in this study

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