



May 18th, 5:00 PM - 7:00 PM

## Study of cardiovascular dynamics during graded Head-up Tilt Test in the young with syncope tendency

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# **Study of cardiovascular dynamics during graded Head-up Tilt Test in the young with syncope tendency**

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Syncope is a transient loss of consciousness, characterized by rapid onset, short duration, and spontaneous recovery. Vasovagal syncope affects a third of the population and is related to an abnormal and exaggerated reflex response of autonomic nervous branches, leading to cerebral hypoperfusion secondary to a decrease in blood pressure (BP). People with this disorder have a lower quality of life, a higher risk of injuries, and, for older people, an increased risk of cardiovascular events. Head-up Tilt Test (HUT) changes body position from supine to upright on a motorized table, shifting blood to the lower part of the body. This stressor discharges arterial baroreceptors that control BP via negative feedback modulating cardiac and vasoconstriction activity. The mechanism that triggers vasovagal syncope is not clear, and its diagnosis continues to be a problem for the clinician and the health system.

The respiratory and cardiovascular (ECG and continuous BP) responses to HUT at 20°, 45°, and 70° of eight syncope and 12 healthy participants were recorded using a Finapres device in the Institute for Biological and Medical Engineering at the Pontificia Universidad Católica de Chile. The different angles were chosen to study the response of low-pressure baroreceptors and the integration of arterial baroreceptors. The phase synchronization approach was used to evaluate the hemodynamic and respiratory fluctuations during orthostatic stress, obtain information about how these dynamic systems interact, and study possible alterations of the control mechanisms. Power spectral analysis and spontaneous baroreflex sensitivity analysis were also applied.

The syncope group showed a loss of integrity of baroreflex and coupling with respiration along with changes in power spectral contrary to the response of healthy subjects. The characterization of the response profiles will allow recognizing and improving the diagnosis of subjects with a tendency to syncope and enhance the understanding of the mechanisms of cardiovascular regulation.