

## **THE PREDICTIVE VALUE OF A MULTIVARIATE MODEL OF AUTONOMIC AND BAROREFLEX FUNCTION APPLIED TO PATIENTS WITH REFLEX SYNCOPE**

*Sérgio Matoso Laranjo, Cristiano Tavares, Mário Martins Oliveira, Isabel Rocha*

*Cardiovascular Autonomic Function Laboratory, Faculdade de Medicina de Lisboa, Lisboa, Portugal*

**Aims:** The involvement of autonomic and baroreflex function in the pathophysiology of reflex syncope (rS) is controversial. There are no data supporting its clinical usefulness including their predictive value on rS diagnosis. Our aim was to develop a mathematical model to evaluate autonomic and baroreflex function role on the prediction of the response to tilt test of rS patients.

**Methods:** Patients (n= 248), 61% females, aged 48±12 y, were placed in a tilt bed. Blood pressure (BP), RR intervals (RRI), cardiac output (CO) and total peripheral resistance (TPR) were continuously monitored for 10 minutes, in supine position, after which patients were tilted to 70°. As symptoms (syncope or presyncope) developed, the bed returned to 0° and the evaluation was terminated. Otherwise, the test would end after 20 minutes. Heart rate (HRV) and systolic blood pressure (sBPV) variabilities were analyzed by a in lab software. Baroreflex sensitivity (BRS; sequence method) and baroreflex effectiveness index (BEI) were calculated. Patients were divided, according to their response to tilt, in fainters and non-fainters. A multivariate logistic regression function fitting the supine and orthostatic phases was used to assess the association between the studied variables and the events by the Odds Ratios (OR; 95% CI).

**Results:** From all patients, only 151 (61%) experienced rS. Sex and age distributions of fainters and non-fainters were not different. In supine position, significant differences on analyzed parameters were observed between the two groups as fainters had significantly lower sBP, CO, TPR, HRV and sBPV powers and an impaired BRS characterized by a lower gain and an increased latency. In this group, the onset of the orthostatic challenge was characterized by an almost 2x increase in LF (sympathetic) power, associated with a steep decrease of TPR, CO and BRS function (with a 3x increase in latency) and a lower BEI.

The presence of low HRV (OR:2.1), low sBPV (OR:1.5) and a BRS below mean values (BEI < 45%, OR:3.5; increased latency > 1.5s, OR:2.9) at baseline and within the 5min after the initiation of the orthostatic challenge are significant and independent markers for the development of a syncopal event induced by tilting. Moreover, when BEI values were added to any of the above mentioned independent factors, a significant increase in discrimination and model fitting was observed (OR 4.1, P<0.05) leading to an increase in sensibility (92,4%) and specificity (87%) to predict a syncopal event.

**Conclusions:** This is the first study showing that impaired BRS during orthostatic challenge has an independent and incremental value in predicting the occurrence of syncope, thus supporting its potential usefulness in the clinical management of patients. BRS-based risk stratification can also be more effective when integrated with the other variables that have been shown to play independent roles

in predicting syncope.