

Autonomic Control and Baroreflex Sensitivity Before and After Transcatheter Aortic Valve Implantation

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Transcatheter aortic valve implantation (TAVI) is the recommended procedure for patients affected by severe aortic valve stenosis who are considered at too high risk for surgical aortic valve replacement. Even though TAVI provides an alternative to open-heart surgery, TAVI patients are still at high risk of developing post-procedural adverse events. The assessment of cardiovascular control and baroreflex, especially during a postural challenge known to evoke an autonomic response, could help in stratifying the risk.

The characterization of cardiovascular control and baroreflex was performed in 22 patients (age: 80.73±6.63 yrs, 9 females, 13 males) undergoing TAVI studied one day before (PRE) and within seven days after the procedure (POST) via the analysis of spontaneous heart period (HP) and systolic arterial pressure (SAP) fluctuations at REST in supine position and during active standing (STAND). Mean and variance of HP and SAP variability were computed together with spectral and cross-spectral markers in the low frequency (LF, 0.04-0.15 Hz) and high frequency (HF, 0.15-0.4 Hz) bands. The gain of the transfer function from SAP to HP in the LF band was taken as an estimate of baroreflex sensitivity (BRS).

At PRE none of the markers varied with the postural challenge, thus indicating that autonomic control and baroreflex were depressed. On the contrary, at POST TAVI patients showed an increase of the SAP variance from 27.24±19.26 mmHg² at REST to 48.62±37.12 mmHg² during STAND. At REST BRS was smaller in POST with respect to PRE (1.60±1.07 vs 3.32±3.14 ms/mmHg) and did not vary with STAND.

The present findings suggest that sympathetic control was improved after TAVI, while baroreflex control mechanism remained depressed immediately after the procedure. This combination might expose TAVI patients to a high risk of developing post-procedural adverse events.

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