Anesthetic cardioprotection in coronary artery surgery? The Results of the Volatile Anesthetics and Cardioprotection Multicentre ANalysis (VACMAN)

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Introduction
Experimental data show that volatile anesthetics protect against the consequences of reversible myocardial ischemia and reperfusion injury.

Clinical studies have been mainly monocentric with inconsistent results.

Hypothesis: the use of a volatile anesthetic regimen is associated with less postoperative myocardial damage, as evidenced by a lower troponin T release.

Methods
Multicentre Randomized controlled trial:
8 participating centres in Flanders, Belgium

Regimen for administration of volatile anesthetics: starting at a minimal end-tidal concentration of 0.5 MAC at least 30 minutes before the initiation of myocardial ischemia to at least 10 minutes after the beginning of reperfusion.

Primary outcome variable: myocardial cell damage quantified by the area under the curve for cardiac troponin T blood concentrations over the first 24 hrs (AUC₂₄h) and the peak level of troponin T (Tmax)

Secondary outcome variables: length of hospital stay; 30-day and 1-year mortality

Results

<table>
<thead>
<tr>
<th></th>
<th>TROP T MAX (P=0.3343 NS) MULTIVARIATE</th>
<th>HOSPITAL LENGTH OF STAY (P = 0.0213) MULTIVARIATE</th>
<th>ONE-YEAR MORTALITY (P = 0.0475) UNIVARIATE</th>
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</thead>
<tbody>
<tr>
<td>Intravenous (Group 1)</td>
<td>0.75 ± 1.42 ng.mL⁻¹</td>
<td>11 days (range 5 to 87 days)</td>
<td>7.4 %</td>
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<tr>
<td>Sevoflurane (Group 2)</td>
<td>0.57 ± 1.03 ng.mL⁻¹</td>
<td>9 days (range 5 to 61 days)</td>
<td>2.5 %</td>
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<tr>
<td>Desflurane (Group 3)</td>
<td>0.46 ± 0.46 ng.mL⁻¹</td>
<td>10 days (range 5 to 54 days)</td>
<td>2.8 %</td>
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Conclusion
The results of this multicenter study on 673 coronary surgery patients could not demonstrate a lower postoperative troponin T release when using a volatile anesthetic regimen (sevoflurane or desflurane) compared with a total intravenous anesthetic regimen. However, the use of a volatile anesthetic regimen seemed to be associated with a shorter hospital length of stay and there was a tendency for a lower one-year mortality.

*VACMAN study group = Jeroen Huys, Patrick Wouters, Ghent University Hospital, Ghent; Dirk Vlasselaers, Patrick Wouters, University Hospitals Leuven, Leuven; Stefan De Hert, University Hospital Antwerp, Antwerp and University of Amsterdam, Amsterdam; Rob Barbé, Imelda Hospital, Bonheiden; Jean-Paul Ory, Jan Dewandere, Virga Jesse Hospital, Hasselt; Dirk De Kegel, Bruno Verhamme, Heilig Hart Hospital, Rosselaire; Ruggero Donadonni, Eef Delombaerde, Maria Middelaes Hospital, Ghent; Jean-Luc Demierre, Sint Jan Hospital, Brussels; Jan Muller, Eric Schelstraete, Sint Jan Hospital, Brussels.