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Potassium canrenoate prevents aldosterone-induced hypoxia-reoxygenation injury in isolated human right atrial myocardium in vitro

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Introduction: Atrial fibrillation (AF) is the most common complication after cardiac surgery and is responsible for significant morbidity and mortality. To assess whether preconditioning with renin-angiotensin-aldosterone system agents could limit myocardial tissue injury, we tested the force of contraction after cardiac surgery and is responsible for significant morbidity and mortality.

Materials and methods: We studied the effect of aldosterone and/or mineralocorticoid receptor (MR) antagonist potassium canrenoate administration prior to hypoxia-reoxygenation and in normoxic condition on force of contraction in 51 human right atrial trabeculae obtained from patients scheduled for coronary artery bypass surgery or aortic valve replacement. We also tested if aldosterone exposure results in changes in levels of ERK1/2 phosphorylation.

Results: The force of contraction of trabeculae was significantly reduced by aldosterone administration under normoxic or hypoxia-reoxygenation conditions. The rapid onset of this effect – 25 minutes – suggests a nongenomic mechanism. When compared with controls, potassium canrenoate by itself was not able to induce cardioprotection. However, coadministration of aldosterone and potassium canrenoate preconditioned isolated human atrial myocardium exposed to hypoxia – reoxygenation. This effect could be MR-dependent or not because both aldosterone and potassium canrenoate have some nongenomic MR-independent actions. Preliminary results showed that aldosterone exposure increased ERK1/2 phosphorylation levels.

Conclusion: Potassium canrenoate-induced cardioprotection prevents the deleterious effect of aldosterone on human atrial myocardial tissue. Further research required to determine the mechanism involved and the potential benefit in clinical practice in order to reduce the incidence of postoperative atrial fibrillation.

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Can the “Bleeding Academic Research Consortium” (BARC) classification be applied to pulmonary embolism?

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Background: Bleeding is associated with higher risk of adverse outcomes in pulmonary embolism (PE). The “Bleeding Academic Research Consortium” (BARC) developed a classification of events combining laboratory & clinical parameters, but based on acute coronary syndrome patients. We investigated whether this classification is applicable in the context of PE, where no standard bleeding definition exists.

Methods: Prospective, single-center registry of patients with confirmed PE. We excluded BARC types 1 or 4 bleeding, considered not to be applicable to the context of PE. BARC type 2 bleeds were defined as any overt bleeding requiring non-surgical or medical care, or leading to hospitalisation. Type 3 bleeds were defined as drop of >3 g/dL in haemoglobin, any transfusion, tamponnade, intra-cranial hemorrhage, or bleeding requiring surgical intervention. Type 5 bleeds were defined as any fatal bleed.

Results: From 2007 to 2011, 666 patients with confirmed PE were included; average age 66±18 years; 52% women; 25% low-risk; 61% intermediate-risk and 14% high-risk PE. Treatment was: unfractionated heparin in 93 (14%), enoxaparin in 200 (30%), fondaparinux in 373 (56%). Thrombolysis was given in 167 (25%). Sixty patients (9%) experienced bleeding (n=13, 43, 4 for BARC types 2, 3, 5 respectively). Main in-hospital events are shown in table 1. By multivariate analysis, independent predictors of in-hospital death were: cardiogenic shock (OR 12.6 [4.8-20.8]); chronic obstructive pulmonary disease (OR 5.27 [2.25-11.3]); acute right ventricular dysfunction (OR 2.98 [1.25-6.96]) and any bleeding (BARC 2,3,5) (OR 3.15 [1.34-7.37]).

Conclusion: Our data suggest that the BARC classification can be applied to acute PE and that bleeding is associated with unfavourable in-hospital outcome. We suggest use of the BARC as the standard for classification of bleeding events in PE.

Table – Results

<table>
<thead>
<tr>
<th>BARC type</th>
<th>No bleed</th>
<th>p (A) vs (C)</th>
<th>p (B) vs (C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death</td>
<td>2 (15.4%)</td>
<td>7 (15%)</td>
<td>19 (3.1%)</td>
</tr>
<tr>
<td>Recurrent PE</td>
<td>0</td>
<td>4 (8.5%)</td>
<td>5 (0.9%)</td>
</tr>
<tr>
<td>Treatment escalation</td>
<td>1 (7.7%)</td>
<td>2 (4.2%)</td>
<td>4 (0.7%)</td>
</tr>
</tbody>
</table>

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Prevalence, awareness, treatment and control of hypertension in a self-selected sub-Saharan African urban population: A cross-sectional study

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