Abstract: P331

Effect of exercise stress test on platelet function in patients with recent acute myocardial infarction

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Background: Exercise-based cardiac rehabilitation for coronary artery disease (CAD) is associated with lower cardiovascular mortality. On the other hand, acute strenuous exercise has been linked to cardiovascular complications such as acute myocardial infarction (AMI) and sudden cardiac death. One of the pathophysiological mechanisms involved in these outcomes might be an increase in platelet aggregability after exercise. Although previous studies showed higher platelet aggregability after exercise among stable CAD patients on aspirin treatment, there is no data regarding the effect of exercise on platelet activity in post-AMI patients on dual anti-platelet therapy (DAPT).

Purpose: To evaluate the effect of high-intensity exercise on platelet aggregability in sedentary post-AMI patients on DAPT.

Methods: Platelet function was analyzed immediately before and after maximal cardiopulmonary exercise test (CPET) on cycle ergometer utilizing a personalized ramp protocol and aiming to achieving peak exercise in around 10 min. The CPET was done within 31±4 days after uncomplicated AMI. Platelet aggregability was assessed by Multiplate® ADPtest (MP-ADP) and Multiplate® ASPItest (MP-ASPI) measured as area under the curve (AUC). Reticulated platelets were measured concomitantly to MP-ADP and MP-ASPI using a fully automated flow cytometer (Sysmex XN-2000®) to determine absolute immature platelet count (IPC) per 10³/microliter. Continuous variables were expressed as means ±standard deviation or as median and 25th–75th percentiles if not Gaussian distributed. Comparisons between the pre- and post-CPET assessments were performed using Wilcoxon signed rank test.

Results: We analyzed 81 sedentary patients (mean age 58.3±10.1 years-old, 76.5% men) after AMI (50.6% with ST-elevation myocardial infarction, mean left ventricular ejection fraction after index event 55±11.7%, 98.8% on statin and 85.5% on beta-blocker treatment). Platelet aggregability, either by MP-ADP or MP-ASPI, and IPC were significantly increased after CPET (table).

Conclusion: On this post-AMI population, platelet was hyperactivated after exercise stress test despite the use of DAPT. These findings suggest that, even when properly treated, post-AMI patients might be at higher risk of ischemic complications after high-intensity exercises, reinforcing the importance of tailoring exercise prescription in this population.

Platelet function after CPET

<table>
<thead>
<tr>
<th></th>
<th>Before CPET</th>
<th>After CPET</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiplate® ADPtest (AUC) − median (25th–75th percentiles)</td>
<td>32.0 (22.0–48.5)</td>
<td>37.0 (26.0–55.2)</td>
<td>0.003</td>
</tr>
<tr>
<td>Multiplate® ASPItest (AUC) − median (25th–75th percentiles)</td>
<td>17.0 (12.7–22.0)</td>
<td>22.0 (16.7–28.0)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Immature platelet count (10³/microliter) − median (25th–75th percentiles)</td>
<td>9.5 (6.8–13.8)</td>
<td>9.6 (6.6–16.5)</td>
<td>0.006</td>
</tr>
</tbody>
</table>

CPET: cardiopulmonary exercise test; AUC: area under the curve.