1-1-1985

Enhanced Hydrogen Peroxide Generation by Human Neutrophils Following Exercise [Abstract]

J. C. Strainer  
*University of Michigan - Ann Arbor*

Donna O. McCarthy  
*Marquette University, donnalee.mccarthy@marquette.edu*

M. Shlafer  
*University of Michigan - Ann Arbor*

M. J. Kluger  
*University of Michigan - Ann Arbor*


Exercise may increase host defenses against infection by increasing neutrophil production of cytotoxic oxygen metabolites, including hydrogen peroxide (HP). Five healthy human subjects underwent 1 hr of vigorous exercise (bicycle ergometer, 50% maximum capacity). Heparinized venous blood samples were taken immediately before, immediately after and 3 hr after exercise. Each subject served as a sedentary control; blood was sampled at times corresponding to exercise studies. Experiments were run at the same time each day. Neutrophils were isolated by density gradient centrifugation and suspended in phosphate buffered saline. HP generation at 37°C was stimulated by phorbol myristate acetate (25 ng/ml; 1 mM azide present) and measured polarographically for 20 min. HP generation was linear during this time. Exercise acutely increased rates and maximum amounts of HP formation by human neutrophils up to 3 hr after exercise. It is not known whether exercise affects neutrophil function in vivo.

<table>
<thead>
<tr>
<th>Group</th>
<th>Pre-Exercise</th>
<th>Post-Exercise</th>
<th>3 hr Post-Exercise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sedentary</td>
<td>61 ± 6</td>
<td>53 ± 4</td>
<td>41 ± 7*</td>
</tr>
<tr>
<td>Exercised</td>
<td>56 ± 7</td>
<td>79 ± 9***</td>
<td>77 ± 7**</td>
</tr>
</tbody>
</table>

* P=0.05; ** P=0.01; *** P=0.001 vs. Pre-Exercise Value