Inhibition or deletion of Adenosine $A_2A$ receptor enhances acetylcholine-induced vascular response: role of angiotensin-II in $A_2A$AR$^{-/-}$ vs. C57Bl/6 mice

Stephanie O. Agba, Ahmad Hanif, Catherine Ledent, Tilley L. Stephen, Mohammed A. Nayeem
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Abstract

In previous studies, we showed that adenosine-induced vascular relaxation was reduced in adenosine $A_2A$ receptor ($A_2A$AR)-null ($A_2A$AR$^{-/-}$) or $A_2A$AR-inhibited C57Bl/6 mice. However, it is unknown the acetylcholine-induced vascular response in $A_2A$AR$^{-/-}$ or $A_2A$AR-inhibited C57Bl/6 mice; therefore, we hypothesized that the acetylcholine enhances endothelial-dependent vascular relaxation in $A_2A$AR-gene deleted ($A_2A$AR$^{-/-}$) or inhibited C57Bl/6 mice compared to their respective controls. Acetylcholine-induced dose dependent vascular response was tested with SCH58261 ($A_2A$AR-antagonist) in C57Bl/6 vs. non-treated C57Bl/6 mice and angiotensin-II (Ang-II) in C57Bl/6 vs. non-treated C57Bl/6 mice, Ang-II treated $A_2A$AR$^{-/-}$ vs. non-treated $A_2A$AR$^{-/-}$ mice and Ang-II treated $A_2A$AR$^{-/-}$ vs. Ang-II treated C57Bl/6 mice. In C57Bl/6 mice, SCH58261 (1µM) increased in acetylcholine-induced dose-dependent vascular relaxation compared to non-treated C57Bl/6 mice. Similarly, in $A_2A$AR$^{-/-}$ mice, acetylcholine enhanced dose-dependent vascular relaxation compared to C57Bl/6 mice. However, acetylcholine-induced dose-dependent vascular relaxation was reduced with angiotensin-II (Ang-II,1µM) in C57Bl/6 compared to non-treated C57Bl/6 mice and acetylcholine-induced dose-dependent vascular relaxation was reduced with Ang-II (1µM) in C57Bl/6 compared to $A_2A$AR$^{-/-}$ treated mice. Our data suggest that the acetylcholine dose-dependent vascular relaxation is endothelial dependent and is enhanced in the absence or inhibition of $A_2A$AR unlike adenosine dose-dependent vascular relaxation in mice.

This is the full abstract presented at the Experimental Biology meeting. There are no additional versions or additional content available for this abstract.