

Expressions of adenosine A_{2A} receptors in coronary arteries and peripheral blood mononuclear cells are correlated in coronary artery disease patients

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Abstract

Background

Altered coronary blood flow occurs in patients with coronary artery disease (CAD). Adenosine strongly impacts blood flow mostly via adenosine A_{2A} receptor (A_{2A}R) expressed in coronary tissues. As part of a systemic regulation of the adenosinergic system, we compared A_{2A}R expression in situ, and on peripheral blood mononuclear cells (PBMC) in CAD patients.

Methods and results

Aortic and coronary tissues, and PBMC were sampled in 20 CAD patients undergoing coronary artery bypass surgery and consecutively included. Controls

were PBMC obtained from 15 healthy subjects. Expression and activity of A₂AR were studied by Western blotting and cAMP measurement, respectively. A₂AR expression on PBMC was lower in patients than in controls (0.83 ± 0.31 vs 1.2 ± 0.35 arbitrary units; $p < 0.01$), and correlated with A₂AR expression in coronary and aortic tissues (Pearson's r : 0.77 and 0.59, $p < 0.01$, respectively). Basal and maximal cAMP productions following agonist stimulation of PBMC were significantly lower in patients than in controls (120 ± 42 vs 191 ± 65 and 360 ± 113 vs 560 ± 215 pg/10⁶ cells, $p < 0.05$, respectively). In CAD patients, the increase from basal to maximal cAMP production in PBMC and aortic tissues was similar (+300% and +246%, respectively).

Conclusion

Expression of A₂AR on PBMC correlated with those measured in coronary artery and aortic tissues in CAD patients, A₂AR activity of PBMC matched that observed in aorta, and A₂AR expression and activity in PBMC were found reduced as compared to controls. Measuring the expression level of A₂AR