

ALTERATION OF ADENOSINE RECEPTORS IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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Chronic obstructive pulmonary disease (COPD) is the fourth leading cause of mortality worldwide. Adenosine acts through four distinct receptors to mediate pro- and anti-inflammatory effects. The primary aim of this study is to investigate the expression in peripheral lung parenchyma, the major site of airflow obstruction in COPD, using immunohistochemistry, radioligand binding and real time quantitative polymerase chain reaction. Adenosine receptors were analyzed in age-matched smokers with COPD and smokers with normal lung function. A₁, A_{2A}, A_{2B} and A₃ receptors were differentially expressed in peripheral lung parenchyma. The affinity of A₁, A_{2A} and A₃ receptors was significantly decreased whereas their density was increased in COPD patients compared with control group. The affinity of A_{2B} receptors was not altered but the density was significantly decreased in COPD patients compared with the control group. A significant correlation was found between the affinity and density of the adenosine receptors and forced expiratory volume in one second (FEV₁)/forced vital capacity (FVC) ratio, an established index of airflow obstruction. In conclusion, this is the first report showing the presence of adenosine receptors differentially expressed in lung parenchyma in COPD compared with control smokers. These novel findings strengthen the hypothesis of a potential role played by adenosine receptors in the pathogenesis of COPD.