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Title: Expression of vascular remodeling markers in relation to bradykinin receptors in asthma and COPD

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Body: Vascular remodeling plays a central role in asthma and COPD. Bradykinin (BK) is a vasoactive peptide involved in asthma. We studied the role of angiogenic factors in relation to BK receptors in asthma and COPD. Bronchial biopsies from 33 COPD, 24 old asthmatics (OA), 18 old control smokers (OCS), 11 old control non-smokers (OCNS), 15 young asthmatics and 10 young control non-smokers were immunostained for CD31, VEGF, angiogenin (ANG) and BK receptors (B2R and B1R). Fibroblast co-localization of relevant molecules was performed by immunofluorescence. BK-induced ANG release was studied (ELISA) in bronchial fibroblasts from asthma. In bronchial lamina propria of OA, CD31+ and VEGF+ cells were more than in OCNS ($p<0.05$). ANG+, B2R+ and B1R+ cells in OA were more than in OCNS, OCS and COPD ($p<0.01$). ANG+ cells were more in COPD than in both OC groups ($p<0.05$). In all asthmatics B2R+ cells were positively related to B1R+ ($rs=0.43$), ANG+ ($rs=0.42$) and CD31+ cells ($rs=0.46$) ($p<0.01$). ANG+ cells were negatively related to FEV1 ($rs=-0.415$, $p=0.008$). Co-localization analysis showed B2R, VEGF and ANG expression in fibroblasts in the bronchial lamina propria of OA. BK induced ANG release in fibroblasts from asthma. This study suggests the involvement of BK receptors in bronchial vascular remodeling in asthma.