**ASTHMA AS A RISK FACTOR OF HUMAN AND EXPERIMENTAL ABDOMINAL AORTIC ANEURYSM**

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*Objective:*Asthma and abdominal aortic aneurysms (AAA) both involve inflammation. It remains unknown whether these diseases interact.

*Approach and Results:*Databases analysis from a population-based nationwide case-control study and the population-based randomized Viborg vascular screening trial demonstrated that asthma diagnosed less than one year or six months before the index date increased the risk of AAA rupture before (odds ratio OR=1.60, 2.12) and after (OR=1.51, 2.06) adjusting for AAA comorbidities. Use of bronchodilators elevated the risk of AAA rupture from ever use to within 90 days from the index date, before (OR=1.10~1.37) and after (OR=1.10~1.31) adjustment. Patients prescribed anti-asthma drugs also showed an increased risk of rupture before (OR=1.12~1.79) and after (OR=1.09~1.48) the same adjustment. Anti-asthmatic medication use associated with increased risk of AAA before (OR=1.45) or after adjustment for smoking (OR=1.45) or other risk factors (OR=1.46).In experimental mice, simultaneous production of asthma and AAA doubled abdominal aortic diameter and increased macrophage and mast cell content, arterial media smooth muscle cell (SMC) loss, cell proliferation, and angiogenesis in AAA lesions. Asthma also increased plasma IgE, reduced plasma IL5, and increased bronchioalveolar total inflammatory cell and eosinophil accumulation. Intraperitoneal administration of an anti-IgE antibody suppressed AAA lesion formation and reduced lesion inflammation, plasma IgE, and bronchioalveolar inflammation. Pre-establishment of asthma also increased AAA lesion size and lesion accumulation of macrophage, mast cell, and media SMC loss, increased plasma IgE, reduced plasma IL5, IL13, and TGF-β, and increased bronchioalveolar inflammation. Consequent production of asthma also doubled lesion size of pre-established AAA and increased lesion mast cell and T cell accumulation, media SMC loss, lesion cell proliferation and apoptosis, plasma IgE, and bronchioalveolar inflammation.

*Conclusion:*Recent active asthma increased risk of AAA and AAA-rupture. Airway allergic disease may have a pathological link with AAA. Production of one disease may aggravate the development and progression of the other.