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Acetylsalicylic Acid Is Associated With a Lower Prevalence of Ascending Aortic Aneurysm and a Decreased Aortic Expression of Cyclooxygenase 2

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Introduction

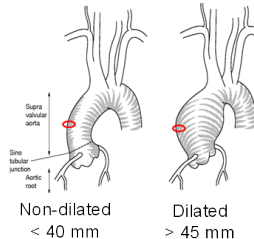
- **Ascending aortic aneurysms**
 - **Tricuspid aortic valve (TAV): Degenerative, inflammation**
 - **Bicuspid aortic valve (BAV): Intimal changes, limited inflammation**
- **Aspirin possibly beneficial for aortic aneurysms, but limited data on ascending aortic aneurysms**
- **No distinction in earlier studies between patients with BAV and TAV**

Aims

- **Determine how aspirin treatment affects prevalence of ascending aortic aneurysm in BAV and TAV**
- **Study effect of aspirin on aortic COX expression**

Materials and methods

- **Retrospective cohort study (DAVAACA, MASAP, ASAP):**
1,700 patients underwent aortic valve and/or ascending aortic surgery (232 excluded; diabetes, monogenic disease, missing data)
- **Ascending aortic dimensions measured with intraoperative TEE**
- Aneurysm = diameter ≥ 45 mm
- **Comorbidities and medications obtained from systematic patient questionnaire**
- **Global gene expression analysis from ascending aortic biopsies**
- **Blood samples**



Aspirin treatment associated with higher age, cardiovascular disease and AS.

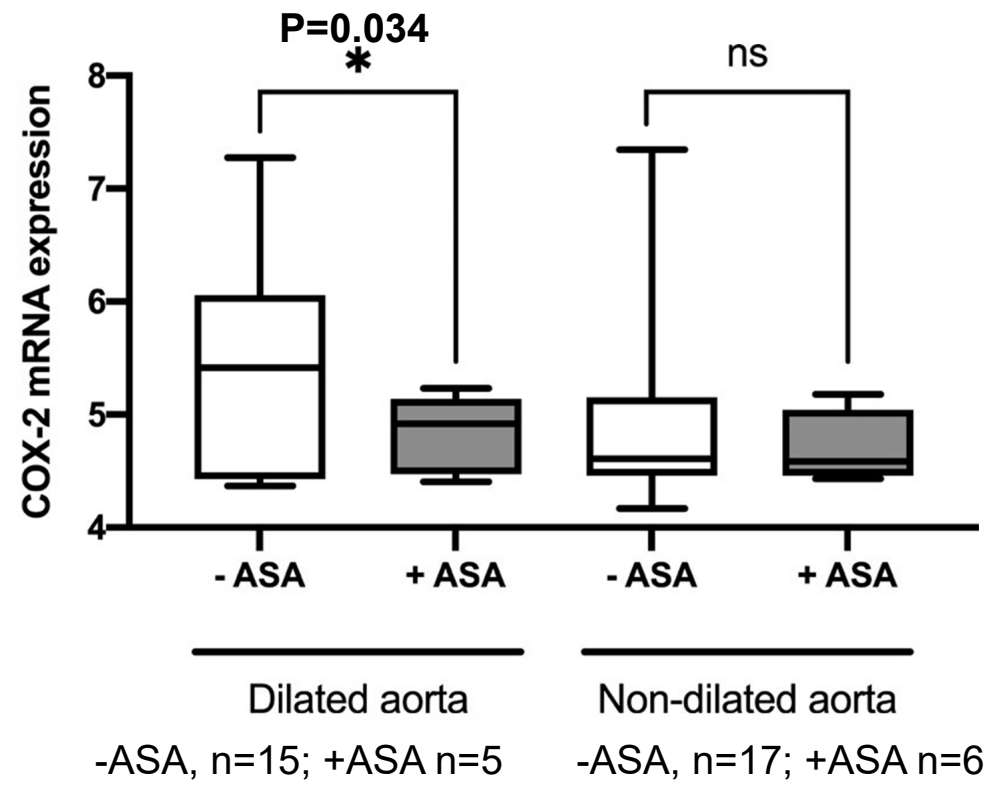
- Inverse association with aortic diameter in TAV group

	TAV patients			BAV patients		
	without ASA (n=458)	with ASA (n=235)	P-value	without ASA (n=609)	with ASA (n=166)	P-value
Male gender, n (%)	293 (63.6)	166 (71.6)	0.036	452 (74.2)	126 (75.9)	0.659
Age, y (SD)	67.7 (10.7)	71.6 (8.1)	<0.001	57.5 (13.4)	63.3 (9.7)	<0.001
Treated hypertension, n (%)	338 (73.3)	198 (85.3)	<0.001	317 (52.1)	121 (72.9)	<0.001
Known vascular disease, n (%)	99 (21.5)	134 (57.8)	<0.001	58 (9.5)	71 (42.8)	<0.001
Corticosteroids, n (%)	16 (3.5)	10 (4.3)	0.617	11 (1.8)	1 (0.6)	0.478*
Anticoagulants, n (%)	93 (20.3)	7 (3.0)	<0.001	55 (9.0)	2 (1.2)	0.001
Other thrombocyte inhibitors	43 (9.4)	13 (5.5)	0.078	21 (3.4)	5 (3)	0.782
AORTOPATHY						
Ascending, mm (SD)	39.5 (10.5)	35.6 (8.0)	<0.001	39.3 (7.8)	39.2 (8.5)	0.292
VALVE DISEASE						
Aortic valve stenosis, n (%)	173 (37.5)	159 (68.5)	<0.001	411 (67.5)	133 (80.1)	0.002
Aortic valve insufficiency, n (%)	224 (48.6)	66 (28.4)	<0.001	191 (31.4)	31 (18.7)	0.001

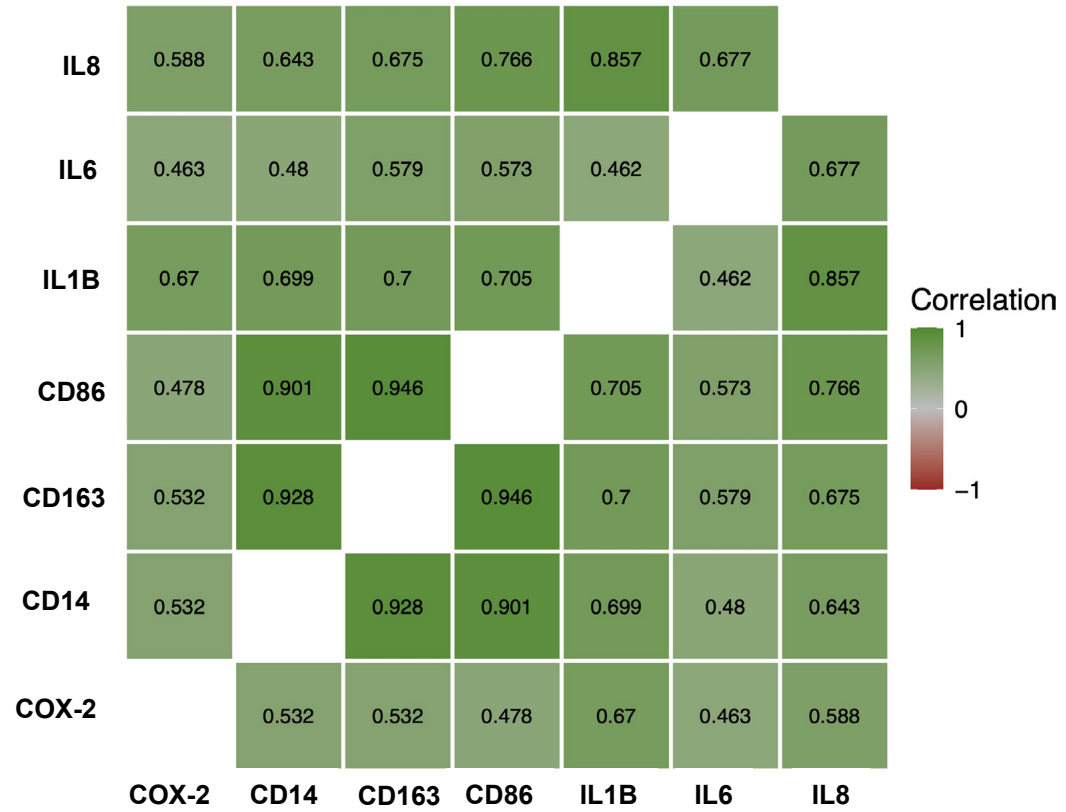
Aspirin associated with lower RR of aortic aneurysm (≥ 4.5 cm), but only in TAV group

Multivariable analysis	TAV patients		BAV patients	
Variable	Relative Risk (95% CI)	P-value	Relative Risk (95% CI)	P-value
Age, y	1.01 (1.00 - 1.02)	0.152	1.02 (1.01 - 1.03)	0.001
BSA (0.1 m ²)	1.63 (0.94 - 2.82)	0.084	2.54 (1.34 - 4.82)	0.004
Male sex	1.06 (0.80 - 1.43)	0.677	1.07 (0.74 - 1.54)	0.720
Known vascular disease	1.13 (0.83 - 1.54)	0.434	0.76 (0.49 - 1.18)	0.210
Treated hypertension	1.11 (0.82 - 1.50)	0.485	1.07 (0.83 - 1.39)	0.589
Chronic inflammatory disease	0.90 (0.52 - 1.56)	0.710	0.74 (0.40 - 1.40)	0.356
Anticoagulants	0.88 (0.62 - 1.26)	0.493	0.72 (0.42 - 1.23)	0.228
Other thrombocyte inhibitors	0.82 (0.52 - 1.29)	0.398	1.15 (0.57 - 2.32)	0.705
Lipid-lowering agents	0.94 (0.71 - 1.24)	0.648	0.86 (0.63 - 1.17)	0.323
Aspirin	0.68 (0.48 - 0.95)	0.026	0.93 (0.64 - 1.34)	0.688
Valve disease, aortic insufficiency	23.60 (10.91 - 51.06)	<0.001	1.82 (1.37 - 2.43)	<0.001

Lower expression of COX-2 mRNA in dilated TAV aortas in patients on aspirin (ASA), no difference in non-dilated



COX-2 expression correlated with proinflammatory markers



n=20

Conclusions

- Aspirin may have a role in treatment and/or prevention of ascending aortic aneurysms in TAV patients, possibly through attenuation of COX-2 mediated inflammation
- Longitudinal studies necessary to study effect on aortic growth rate, in particular at different baseline aortic diameters

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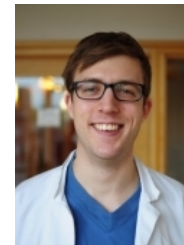
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