

POSTER PRESENTATION

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Stage of estimated glomerular filtration rate (kidney function) is associated with greater prevalence and burden of aortic plaque: the Framingham heart study

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Background

Atherosclerotic aortic plaque (AAoP) is inversely associated with estimated glomerular filtration rate (eGFR), a commonly used continuous measure of kidney function. We sought to determine whether eGFR stage, categorical stratification by eGFR based on Kidney Disease: Improving Global Outcomes (KDIGO) criteria, is also associated with prevalence and burden of AAoP, as clinically patients are often characterized in terms of eGFR stage.

Methods

We quantified prevalence and burden of AAoP in the abdominal aortas of 1690 adults (65±9y, 53% women) from the Framingham Offspring cohort who underwent cardiovascular magnetic resonance (CMR) and serum creatinine measured at the adjacent cycle exam. Abdominal imaging used a free-breathing, ECG-gated T2W axial black blood sequence with 5-mm slice thickness, 5-mm gap and 1.03x0.64 in-plane resolution. The eGFR was calculated from creatinine using Chronic Kidney

Disease Epidemiology Collaboration (CKD-Epi) equations and study participants were stratified by eGFR stage: ≥90, 60-89, <60 ml/min/1.73m². (As few participants had eGFR<60, we combined all of these participants into a single group, whereas KDIGO criteria further stratify patients.) We tested for trends (Cochrane-Armitage test) in prevalence and burden of AAoP by eGFR stage and used multivariable-adjusted logistic (plaque present or absent) and Tobit (plaque volume) regression models to assess association of AAoP with worsening eGFR stage.

Results

Mean eGFR was 84±18 ml/min/1.73m² in both sexes. Table 1 shows prevalence and burden of AAoP by sex and eGFR stage. On MV-adjusted logistic regression greater age (odds ratio, OR=1.32/10 years, p<0.0001), fasting glucose (OR=1.10/10mg/dL, p=0.006), pack-years smoked and current smoking (OR=1.66, p=0.007), cholesterol treatment (OR=1.40, p=0.017) and eGFR stage

Table 1 Prevalence and burden of aortic plaque by eGFR stage.

eGFR	N (%)	Men		Women		
		Prevalent AAoP	AAoP Volume, cm ³	Prevalent AAoP	AAoP Volume, cm ³	
≥90	309 (39.1%)	115 (37.2%)	0.27±0.85	358 (39.8%)	152 (42.5%)	0.36±0.87
60-89	411 (52.0%)	207 (50.4%)	0.60±1.55	455 (50.6%)	237 (52.1%)	0.55±1.20
<60	70 (8.9%)	49 (70.0%)	1.88±2.91	87 (9.7%)	54 (62.1%)	1.16±2.98
P for trend		<0.0001	<0.0001		0.0002	<0.0001

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(OR=1.37 per stage, $p=0.001$) were associated with prevalent AaOP. With Tobit modeling only greater age (hazard ratio, HR=1.23/10 years, $p=0.0002$, log pack-years smoked (HR=1.06, $p<0.0001$) and eGFR stage (HR=1.24, $p=0.005$) were associated with greater amount of AaOP.

Conclusions

In a community-dwelling cohort of middle aged and older adults, reduced kidney function, as assessed by eGFR and KDIGO stage is associated with greater prevalence of and volume of AaOP, even after adjustment for other cardiovascular disease risk factors.

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