

AORTIC STIFFNESS IN THE PRESENCE OF SELF-LIMITING AND SUSTAINED SYSTEMIC INFLAMMATION: COMPARISON OF ACUTE MYOCARDITIS AND CHRONIC INFLAMMATORY DISEASES

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OBJECTIVES: Aortic stiffness, measured by pulse wave velocity (PWV), is an independent predictor of cardiovascular events over and above traditional risk factors.

Previous evidence revealed moderately raised PWV in the presence of presence of systemic inflammatory diseases, such as rheumatoid arthritis (RA) and systemic lupus erythematosus (SLE). Changes in aortic stiffness in response to acute systemic inflammation, such as systemic viral myocarditis, remain unknown.

METHODS: Ninety-nine subjects with either clinical diagnosis of acute myocarditis (n =44) or chronic systemic inflammatory disease (RA and SLE, n=55) underwent standardized cardiac CMR protocol for the assessment of PWV. Thirty-eight apparently healthy subjects served as control group.

Central PWV was obtained by an inplane phase contrast gradient echo sequence with high temporal resolution (120 phases/cardiac cycle) and foot-to-foot measurement.

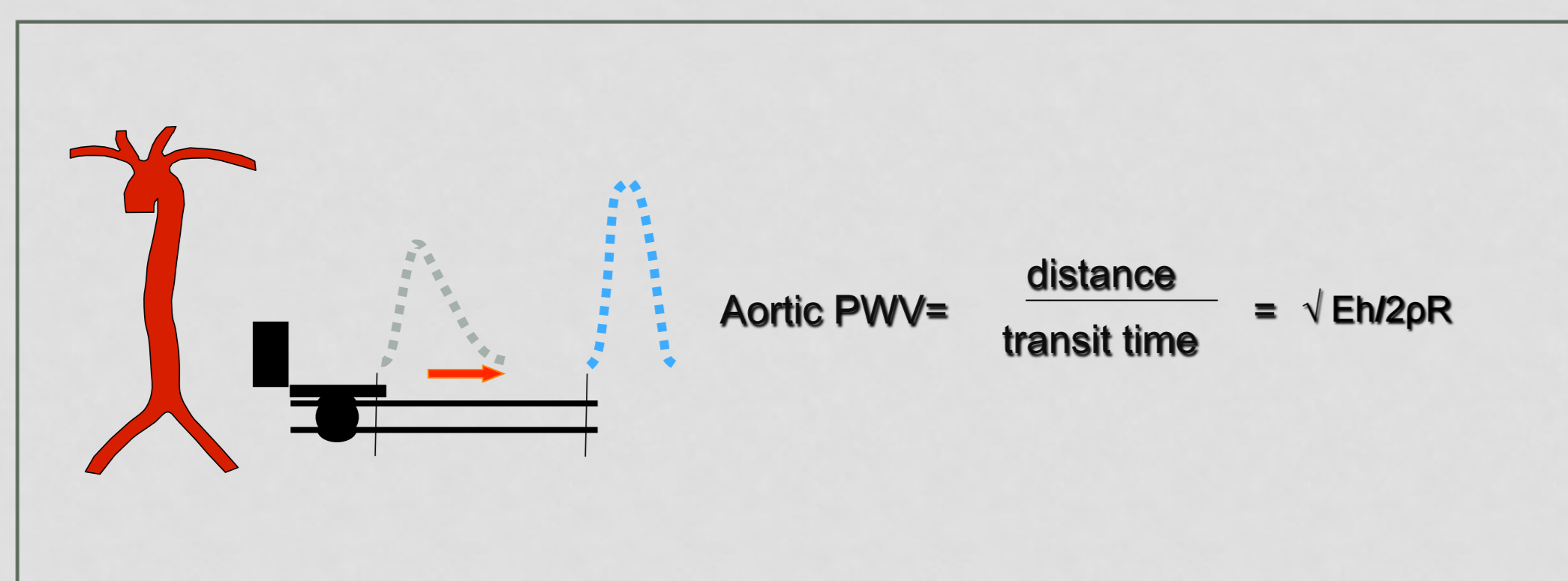


Figure: Aortic PWV calculations

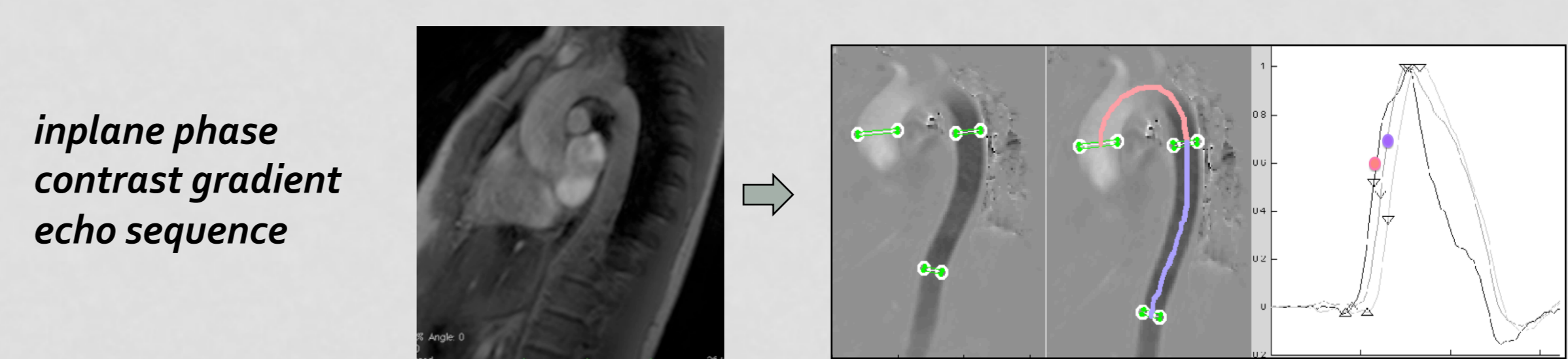
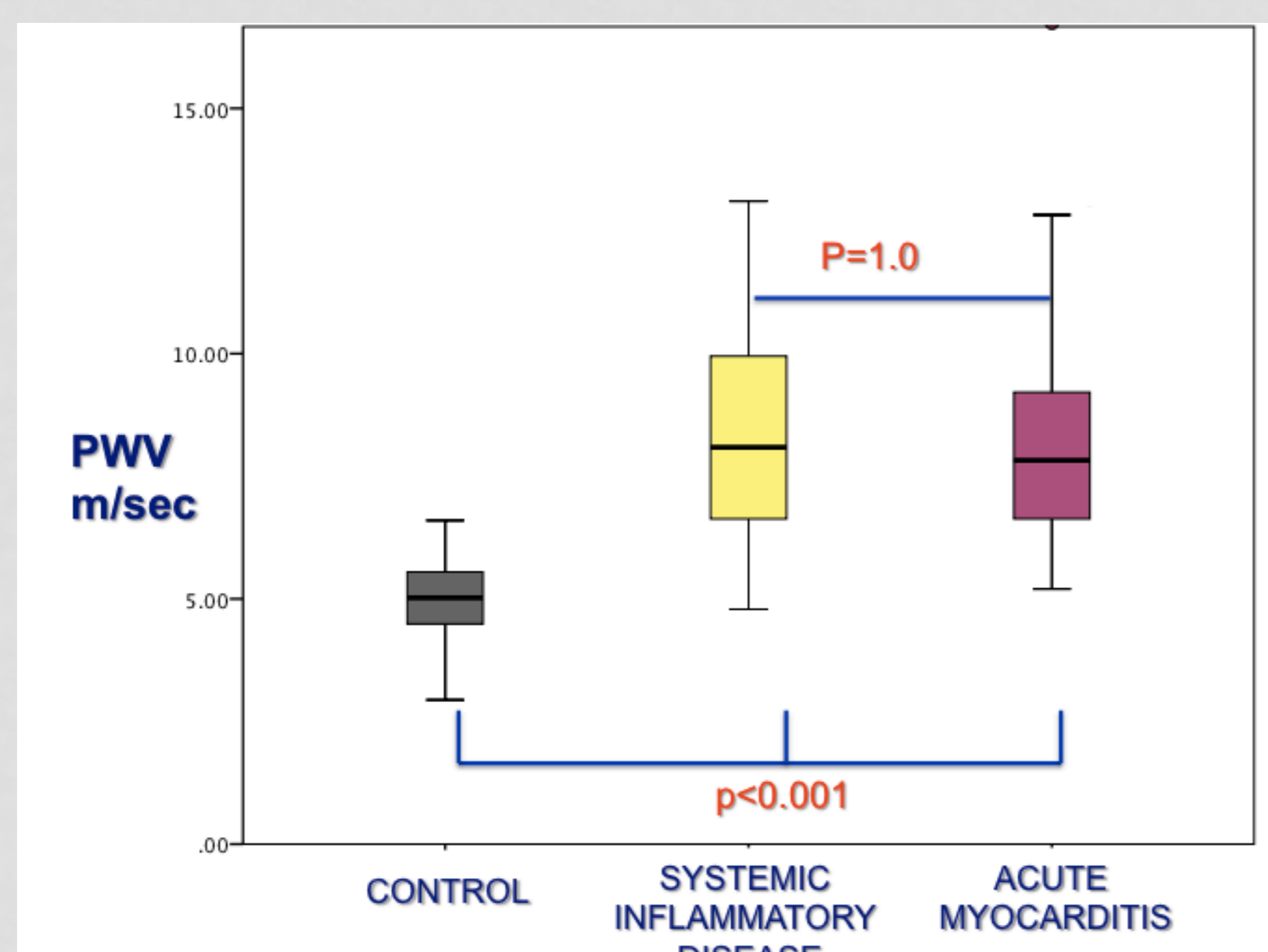


Figure: Image acquisition and post-processing

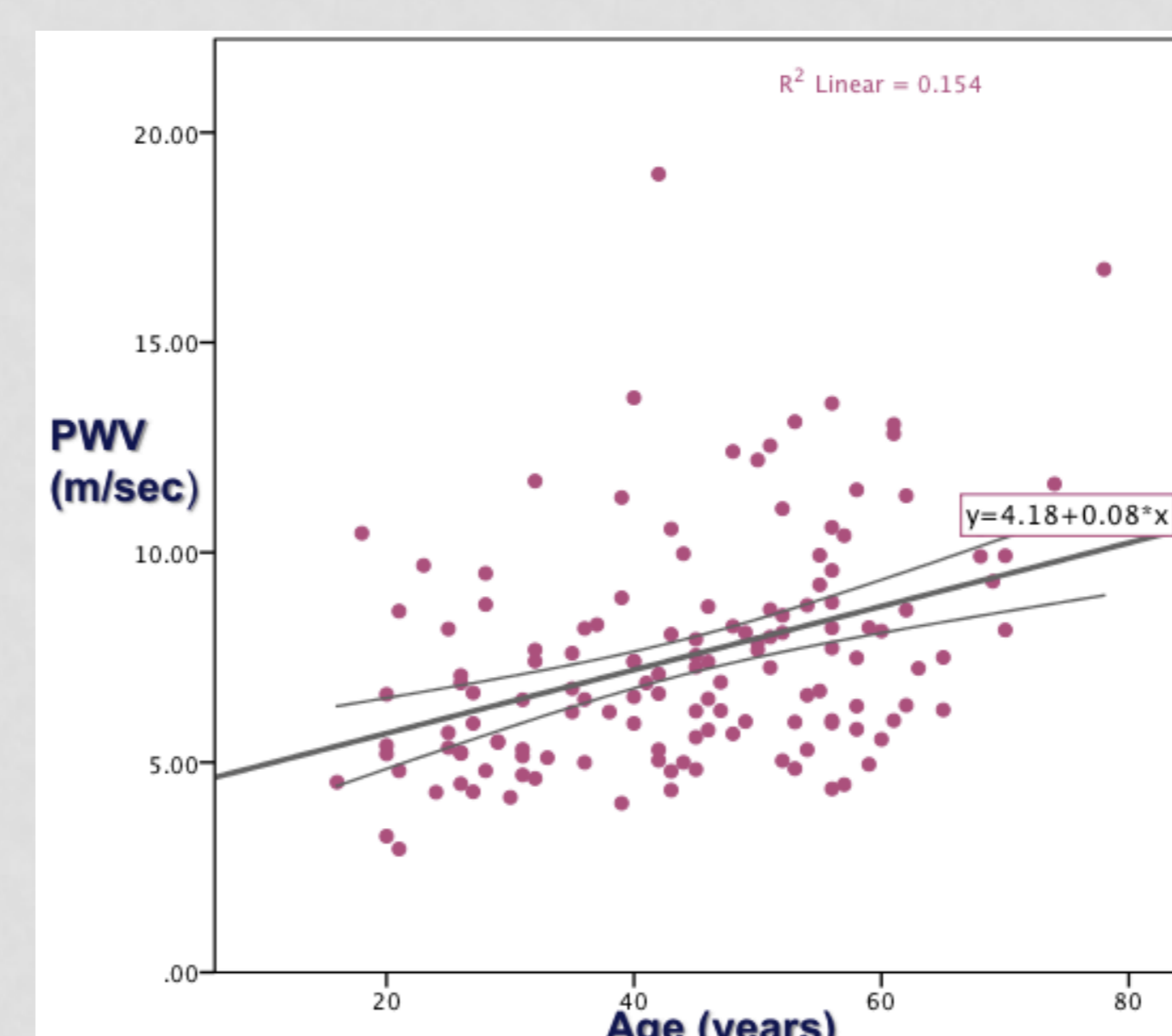
RESULTS:

- Groups were well matched for age, gender and cardiovascular risk factors, with no differences in blood pressure or heart rate between groups.
- Compared to controls, both patients' groups had significantly raised central PWV (control vs. acute myocarditis vs. systemic inflammation, PWV (m/sec): 5.1 ± 1.0 vs. 8.4 ± 2.4 vs. 8.5 ± 2.6 , $p < 0.001$).

- We identified significant relationship between PWV and age (controls, $r = 0.56$; acute myocarditis, $r = 0.51$; and systemic inflammation, $r = 0.4$ $p < 0.0001$ for all), and with conventional cardiovascular risk factors.
- PWV was related to the presence of areas of LGE.



There were no significant differences between the two groups of patients on post-hoc analysis



PWV	r	P value
Age	0.4	<0.05
HTN	0.34	<0.05
HC	0.24	<0.05
Smoking	0.22	<0.001
LGE	0.36	<0.001

CONCLUSION:

We demonstrate for the first time that there is increased aortic stiffness in response to self-limiting inflammatory injury, which is comparable in magnitude to sustained systemic inflammation.

ACKNOWLEDGEMENT

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