**Introduction**

Psoriasis, a chronic inflammatory skin disease, is associated with increased cardiovascular (CV) risk including stroke, MI and major adverse cardiovascular events (Fig 1).

We have previously shown that vascular inflammation (VI) target-to-background ratio (TBR) by FDG PET/CT relates to PASI score (Fig 2).

Psoriasis is also associated with decreased Aortic Distensibility (AD), provides an ideal clinical model to study inflammatory atherogenesis.

**Hypothesis**

Whether improvement in aortic vascular inflammation by FDG PET/CT is associated with improvement in aortic distensibility by MRI is not known.

Thus, we hypothesized that an improvement in vascular inflammation would lead to an improvement in aortic distensibility at one-year.

**Methods**

Consecutively recruited psoriasis patients (N=50) underwent FDG PET/CT and cardiometabolic phenotyping at baseline and at 1-year. Vascular inflammation was assessed as TBR (Fig 3).

Descending aorta contours on MRI were traced throughout the cardiac cycle [Qflow, Medis] to measure AD (Distensibility=Å Vessel area/pulse pressure) (Fig 4).

Longitudinal changes in aortic VI and AD were analyzed by multivariable regression.

**Results**

The cohort was middle-aged, at low Framingham Risk (FRS), and had mild to moderate psoriasis (Table 1).

At follow-up, the total cohort had a median improvement in PASI score of -40% (p<0.001) with use of biological therapy (58%).

Aortic VI decreased by 8% (mean±SEM: 1.81±0.03 vs 1.67±0.04, p=0.04) while AD increased by 10% (0.61±0.03 vs 0.67±0.04, p=0.04).

Moreover, reduction in aortic VI was associated with an improvement in AD beyond traditional CV risk factors, statin use, and systemic/biologic psoriasis therapy (β=-0.36, p=0.04).

**Conclusions**

- Improvement in aortic VI by FDG PET/CT is associated with improvement in AD by MRI at 1-year, suggesting that quelling VI may have a favorable impact on functional characteristics of the aorta.
- These findings further advance our understanding of the role of inflammation in CV disease and the ability of PETMRI to provide valuable information to enhance our understanding of CV disease.
- Our novel findings can help improve the accuracy of CVD risk prediction, enable physicians to make evidence-based decisions, and decrease the global economic burden of cardiovascular disease on healthcare systems.
- However, Ongoing randomized trials are needed to confirm these findings.

**Acknowledgments**

This study was supported by the National Heart, Lung and Blood Institute (NHLBI) Intramural Research Program (HL006193-02).