A Novel Stress Database in Myocardial Perfusion Scintigraphy: Attenuation-Corrected Images

Elin Trägårdh Johansson, MD, PhD,[a] David Jakobsson, MSc,[b] Karl Sjöstrand, MSc, PhD,[b] Lars Edenbrandt, MD, PhD[a,b]

[a]Nuclear Medicine, Skåne University Hospital, Lund University, Malmö, Sweden

[b]EXINI Diagnostics, Lund, Sweden

Disclosure Slide

- **Research Support:** **N/A**
- **Consultant:** **N/A**
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Background

- Stress myocardial perfusion scintigraphy (MPS) is widely regarded as a clinically useful noninvasive imaging modality for diagnosing patients with suspected coronary artery disease

- Localized soft-tissue attenuation by the breasts, lateral chest wall, and abdomen may create artifacts that mimic true perfusion abnormalities and decrease test specificity

Background

- The American Society of Nuclear Cardiology and the Society of Nuclear Medicine conclude in 2004 that incorporation of attenuation corrected (AC) images will improve image quality, interpretive certainty, and diagnostic accuracy.

- Commonly used MPS software usually only include normal stress database for non-attenuation corrected (NC) images.

Aim

- To develop and compare different normal stress databases for MPS, with regard to NC men, AC men, NC women, and AC women.

- The hypothesis was that AC images show less differences between men and women compared with NC images.

Methods

- Patients admitted for 99mTc-MPS at Skåne University Hospital in 2008
- Adenosine or maximal exercise on an ergometer
- 2 day protocol: Stress + rest or only stress
- ECAM, gated stress – non-gated rest
- Attenuation correction using a Gd-153 multiple-line source

Methods

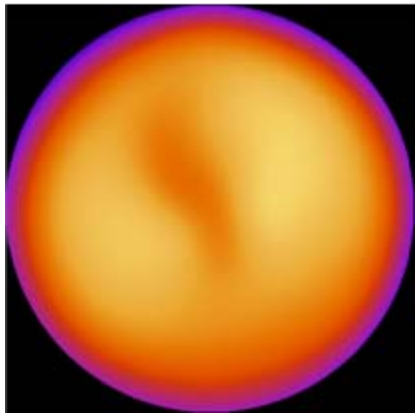
- Inclusion:
  - Neither fixed nor reversible perfusion defects
  - Normal EF and EDV
- Exclusion:
  - Diabetes, CAD, previous MI, previous revascularization
  - ECG signs of MI, pre-excitation, PM and LBBB
- Bull's eye plots for these patients were created, and obvious 'non-normal' patients were excluded.
- Finally, 126 men and 206 women were included.

Methods

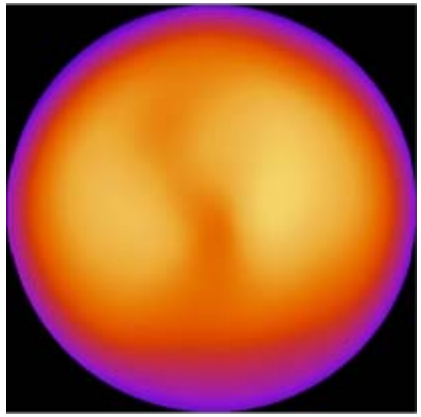
- Normal stress perfusion databases were developed for four groups: NC men, AC men, NC women and AC women

- The comparison method consisted both of a pixel-by-pixel analysis and a segmental analysis

Results

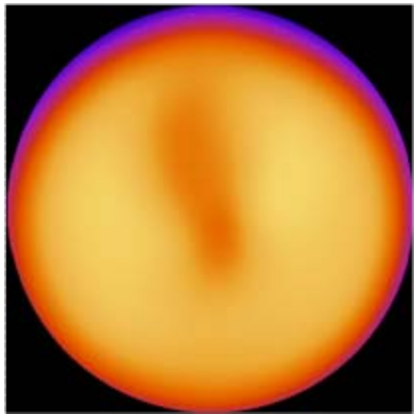


NC

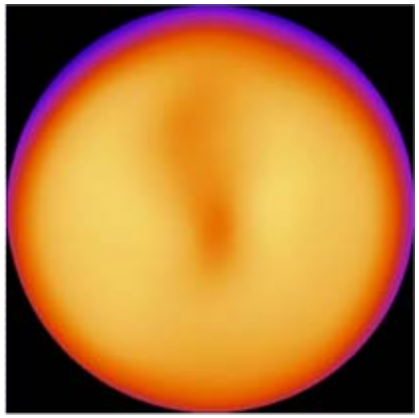


Women

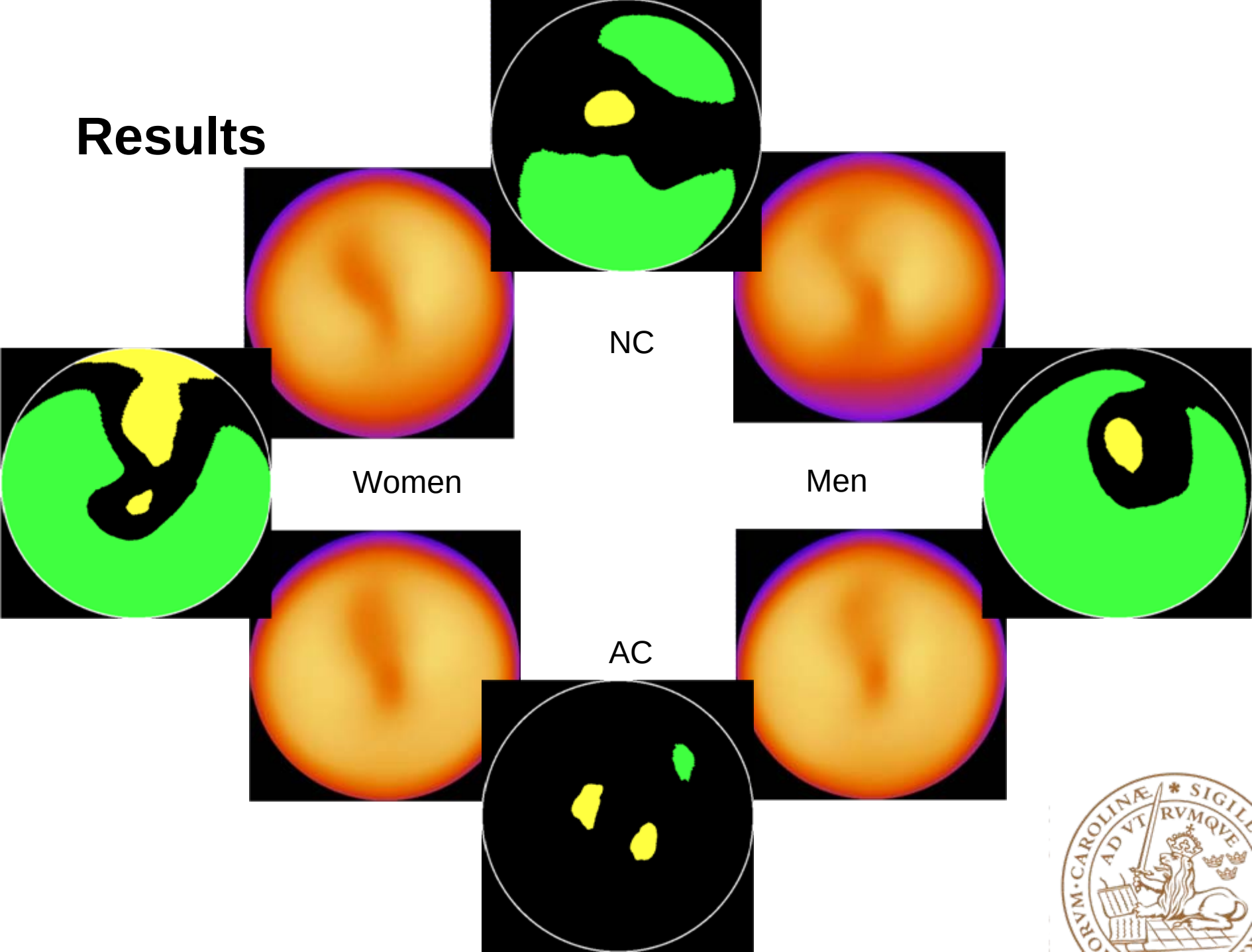
Men



AC



Results



Results

	Women (NC/AC)	Men (NC/AC)	NC (Women/Men)	AC (Women/Men)
Apical	1.5 (±3.9)	1.0 (±6.2)	2.1 (±6.6)	2.1 (±2.4)
Lateral	-3.9 (±8.5)	-4.1 (±9.6)	-1.6 (±4.0)	-2.1 (±3.3)
Inferior	-7.4 (±8.4)	-14.0 (±7.5)	-6.6 (±4.4)	-0.6 (±3.5)
Septal	-5.9 (±5.0)	-7.6 (±7.5)	-0.7 (±6.4)	0.5 (±3.2)
Anterior	2.4 (±6.0)	0.4 (±7.1)	-1.6 (±6.3)	-0.2 (±4.0)

Conclusion

- Differences in mean counts when comparing men and women in the AC group were much smaller than when comparing the other groups.

- The results support the hypothesis that it is possible to use gender-independent AC stress databases.

Future studies

- How many subjects do you need to create a normal stress database?

- How much help is an AC stress normal database compared to a NC stress database?