Alström in the Adult Heart

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Alström Society International 10th International Conference and Scientific Symposium

Sheraton North Baltimore Hotel

UNIVERSITY OF BIRMINGHAM | INSTITUTE CARDIOVA SCIENCES

ALSTRÖM SYNDROME INTERNATIONAL ASI

NHS University Hospitals Birmingham NHS Foundation Trust

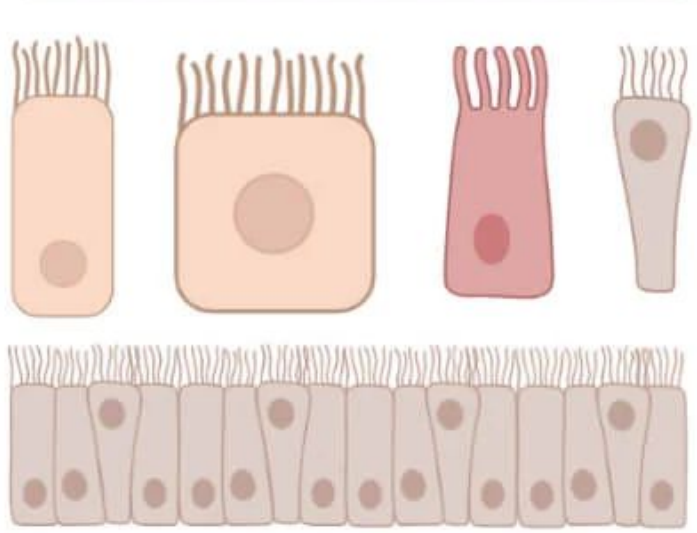
Objectives

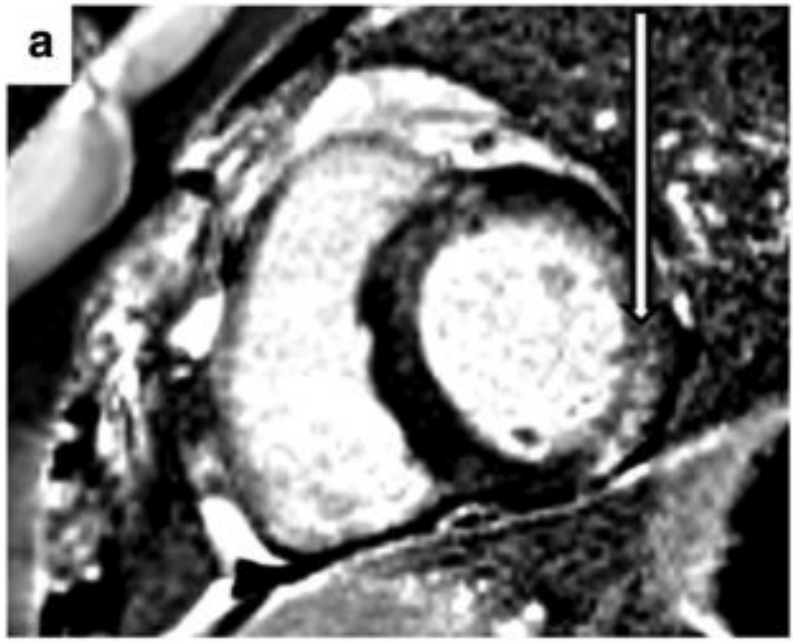
- Background
- Cardiomyopathy in Alström
- Cardiac fibrosis in Alström
- Cross sectional data
- Implications / What can be done

Background

- Ultrarare autosomal recessive ciliopathy
- Childhood retinal cone-rod dystrophy
- Neuronal hearing loss
- Obesity
- Insulin resistance
- Cardiomyopathy

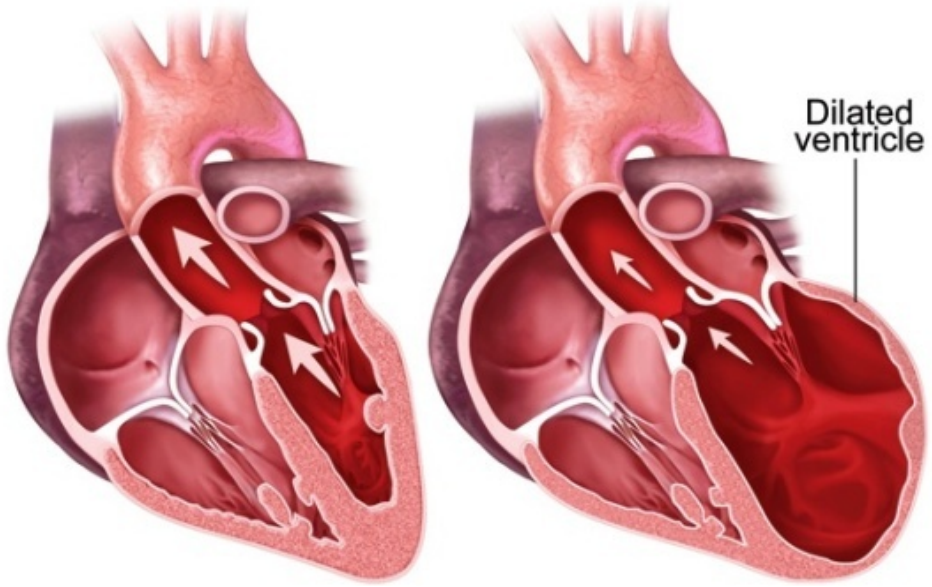
- Multinational geographic distribution

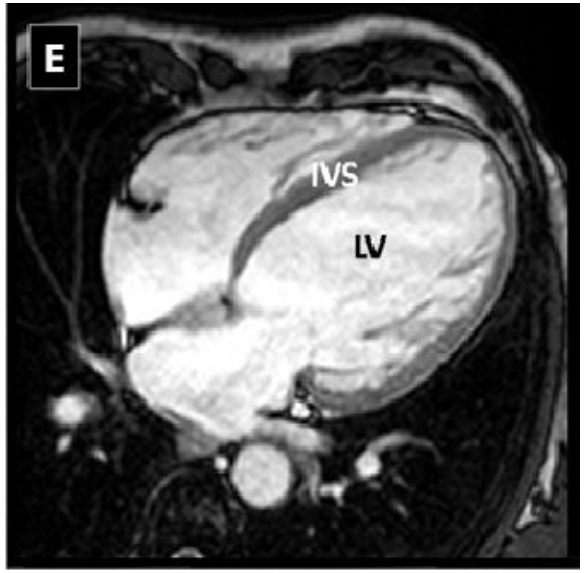


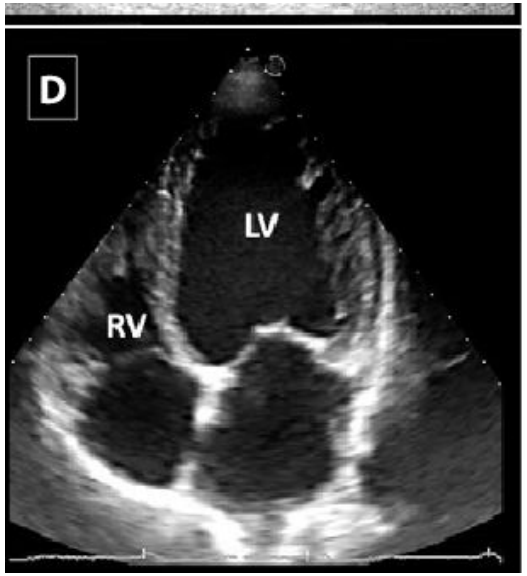


Cardiomyopathy

- Infantile onset
- 50% ALMS patients
- First few weeks of life
- Dilated cardiomyopathy
- Appearance of complete recovery in survivors (74%)
  - ECG
  - Echocardiogram
  - Cardiac MRI
  - Bloods

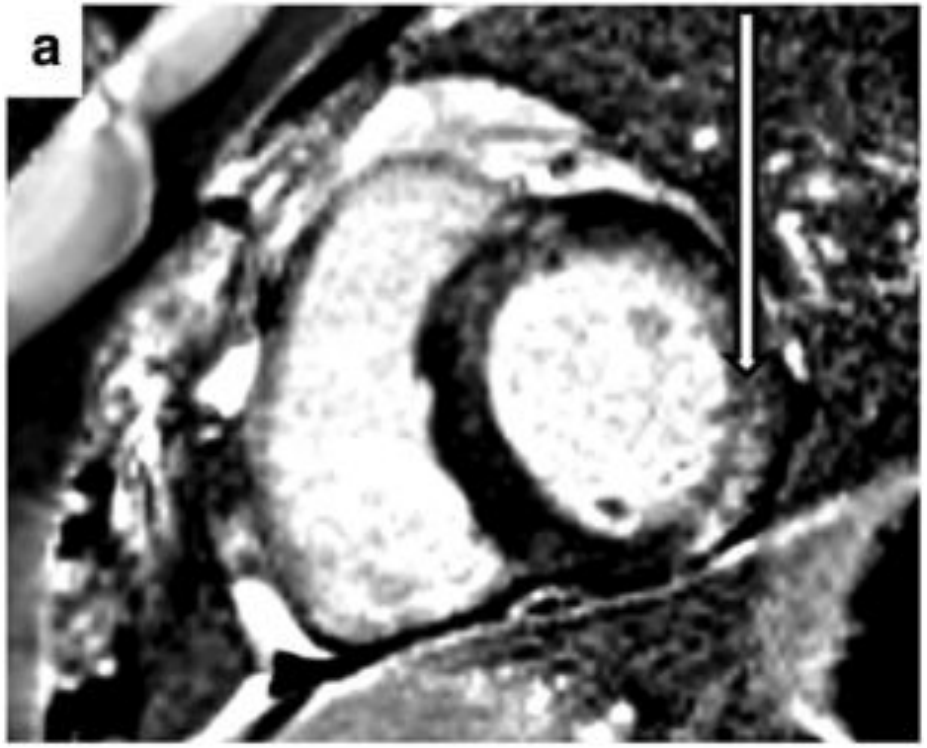


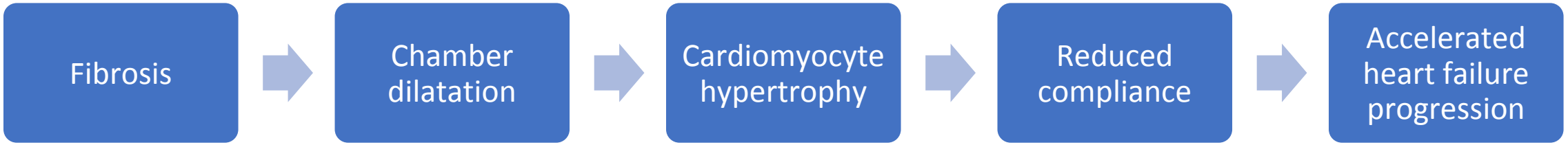




Cardiomyopathy

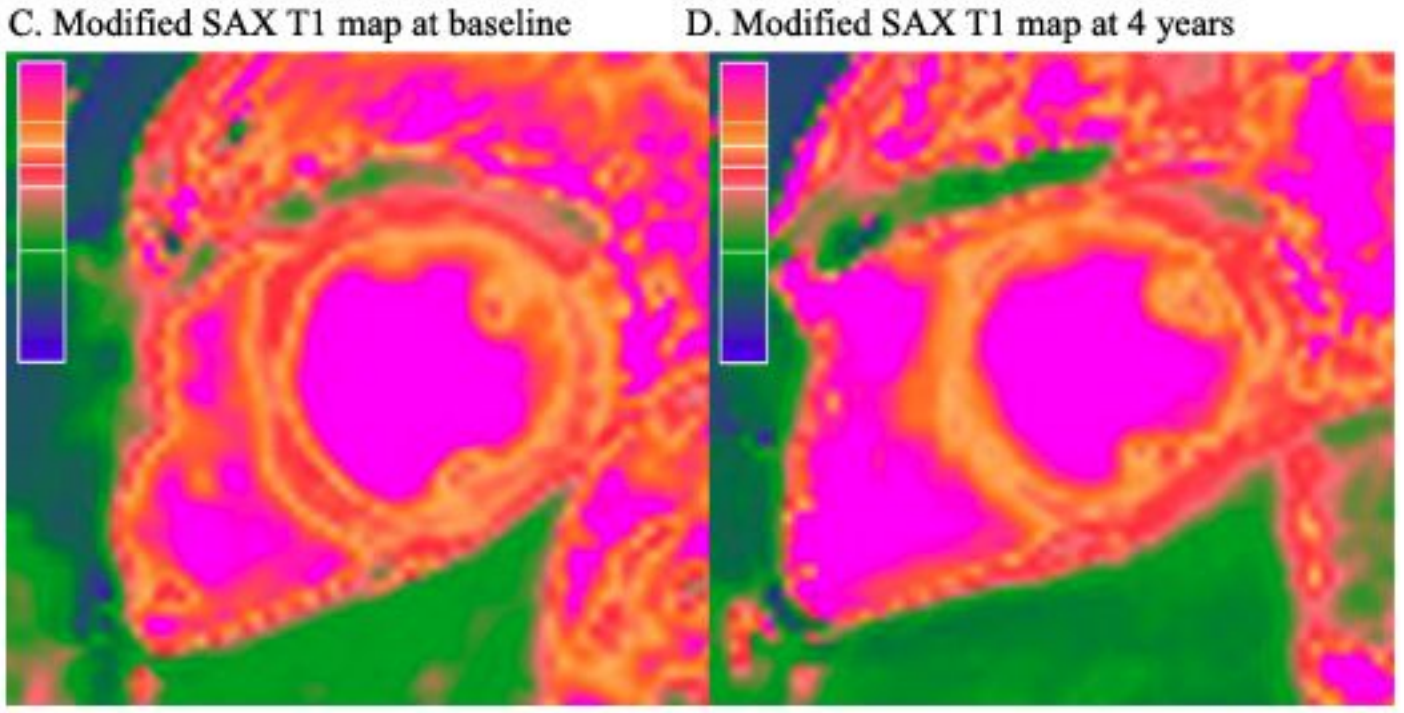
- Cardiovascular disease may recur / develop *de-novo* in adulthood
- Fibrosis identified on cardiac MRI and autopsy
- Present in > 50% patients (Edwards et al 2015)





Changes over time

- Elevation in markers of fibrosis on CMR
- Increased LV mass
- Reduction in GLS
- Suggestion of mild progression of fibrosis over time
- No apparent structural or functional consequences on follow up in systolic / diastolic function.
- Occurs later in the disease process



Underlying drivers

- Diabetes / Insulin resistance
- Hypertension
- Dyslipidaemia
- Coronary artery disease – Above risk factors
- However no association shown between fibrosis and risk of CAD
- Risk of CAD low despite high prevalence of risk factors in ALMS

Beyond the heart

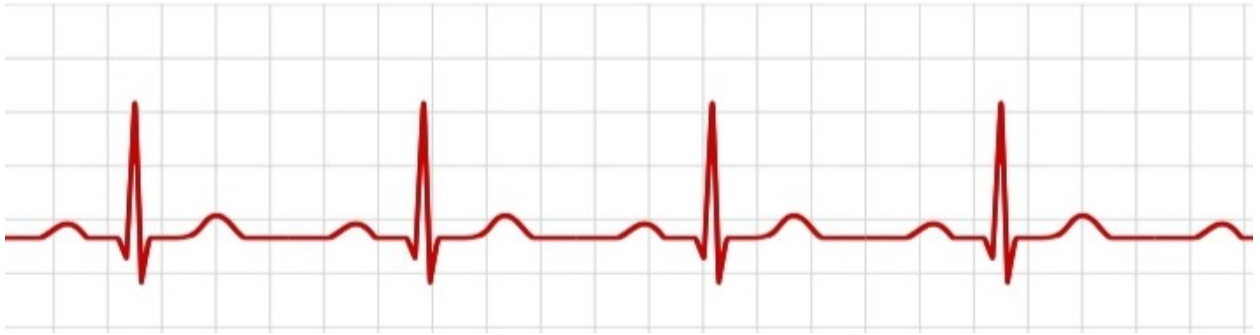
Multi-organ fibrosis seen in AS

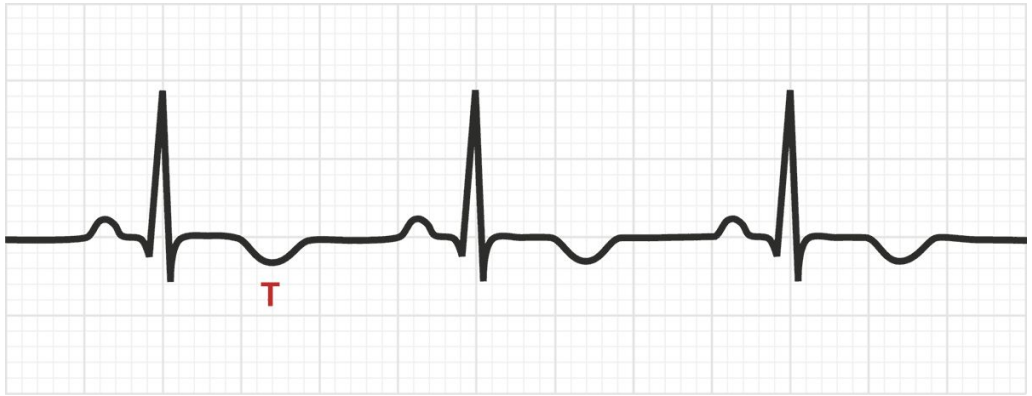
Is cardiac dysfunction / fibrosis an independent process specific to the heart?

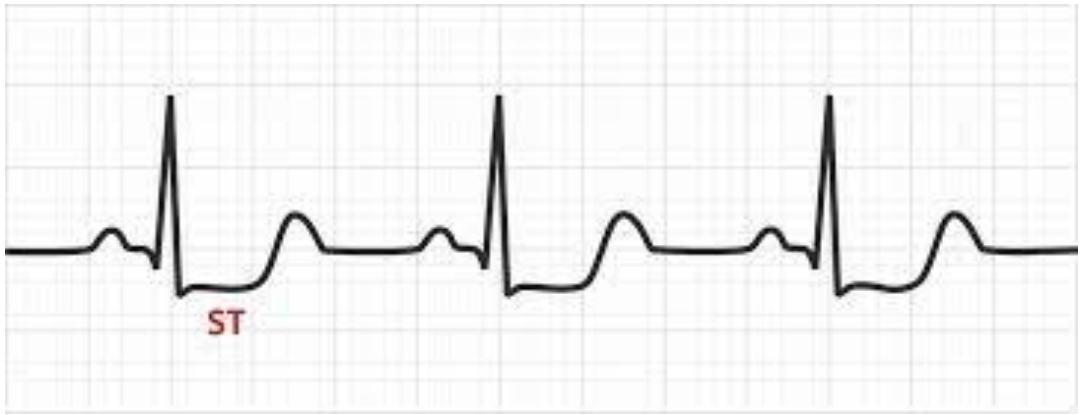
Is it a concurrent process reflecting long term impact of obesity, insulin resistance and the metabolic syndrome?

ECG

- 42 (89%) in sinus rhythm
- 24 (51%) abnormal ECG
- 20 (43%) T wave inversion
- 9 (19%) ST changes







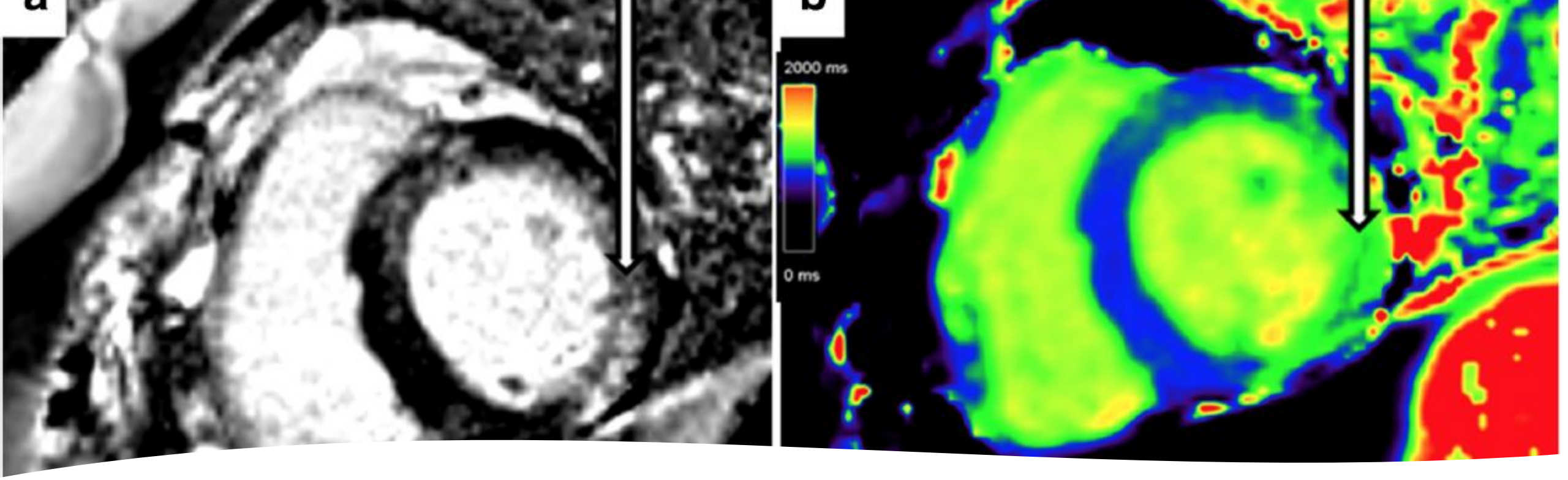
GeroScience
https://doi.org/10.1007/s11357-023-00959-3

ORIGINAL ARTICLE

Phenoage and longitudinal changes on transthoracic echocardiography in Alström syndrome: a disease of accelerated ageing?

Leena Patel · Ashwin Roy · Amor Mia B Alvior · Mengshi Yuan · Shanat Baig · Karina V. Bunting · James Hodson · Katja Gehmlich · Janet M Lord · Tarekegn Geberhiwot · Richard P. Steeds

Received: 6 September 2023 / Accepted: 21 September 2023



Late Gadolinium Enhancement

- AS patients with LGE indicative of myocardial fibrosis have a different cardiac and renal phenotype compared to those without

Why is this important?

- Adult onset cardiomyopathy is common
- Risk factors for development of cardiomyopathy
- Modifiable vs non-modifiable

Signs and symptoms

BREATHLESSNESS

CHEST DISCOMFORT

PALPITATIONS

DIZZINESS

COLLAPSE

How is it diagnosed?

- Clinical assessment
- History and examination
- Observations
- Blood tests
- 12 lead ECG
- Transthoracic Echocardiogram
- Cardiac MRI

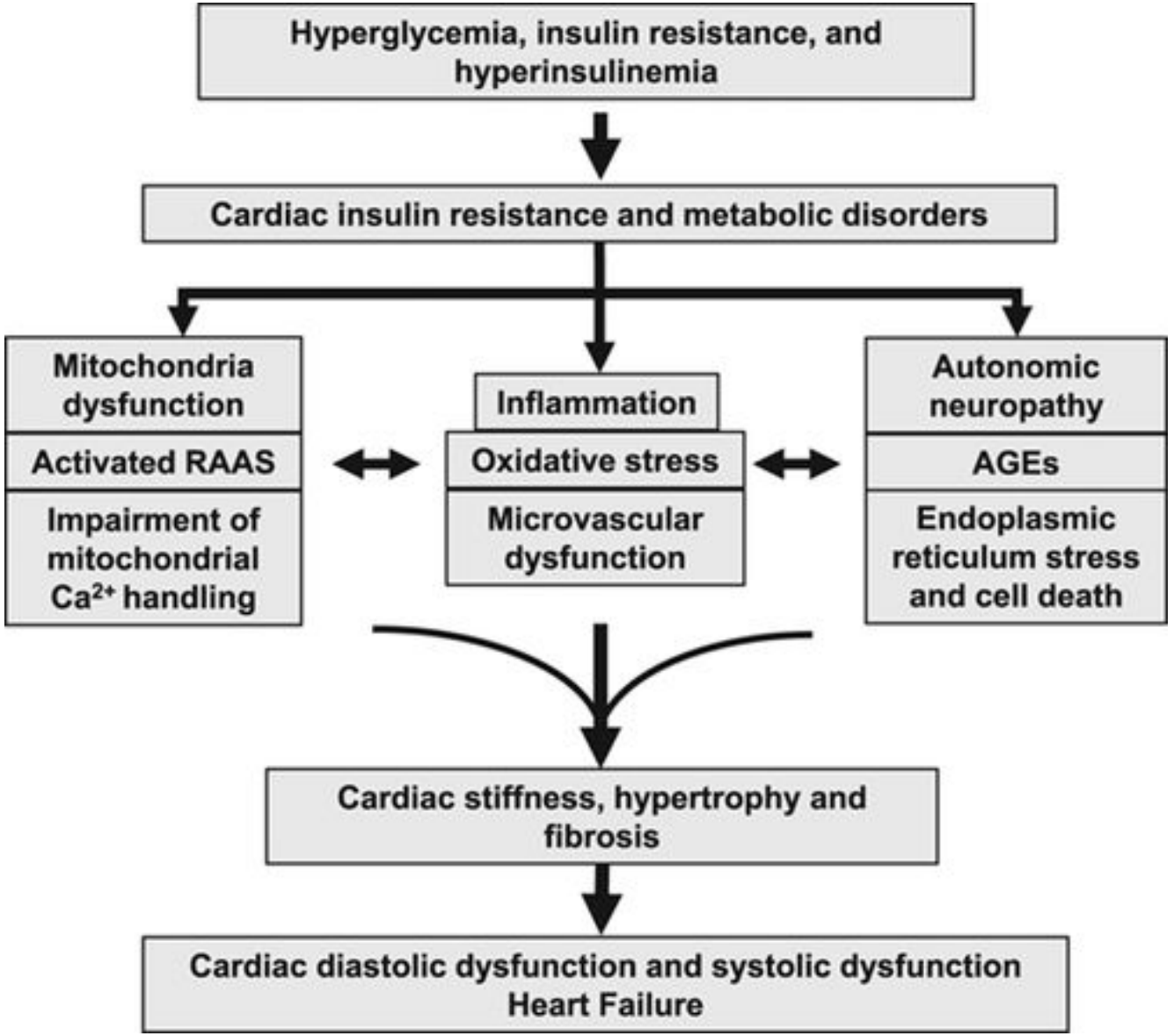
Can it be treated?

Risk factor modification

- Good diabetic control
  - Diet
  - Exercise
  - Compliance with medications

Improve insulin sensitivity

Reduce risk of diabetic CM



Risk factor modification

- Weight /BMI
- Mechanisms of obesity poorly understood
- Fat accumulation is different. Adipocytes shown to be larger
- Leptin resistance
- Beta cell proliferation in pancreatic islets
- Visual / auditory manifestations

Risk factor modification

- Weight /BMI
- Engaging in regular exercise
- Within own limits
- Portion control
- Double effect of weight loss and insulin sensitizing

Risk factor modification

- Coronary artery disease
- Good diabetic control
- Regular Exercise
- Low salt / fat diet
- Smoking cessation
- Alcohol moderation

What can your team do?

- Regular surveillance
  - Clinical assessment
  - Routine tests
- Monitor compliance and ensure correct technique
- Regular physiotherapy and dietetics input

Conclusion

- Adult cardiomyopathy appears to be a continuous and insidious process
- Takes place alongside extra-cardiac manifestations rather than being a driver
- With time, cardiac and renal markers become more impaired
- Risk of developing of worsening cardiomyopathy can be affected by aggressive risk factor modification

Thank you

Acknowledgments
Professor Rick Steeds
Professor Tarekegn Geberhiwot
Ms Leena Patel
Dr Shyam Madathil
Dr Karina Bunting
Dr Mengshi Yuan
Dr Shanat Baig
Ms Amor Mia Alvior