The Association of Incidental Coronary Calcification and imaging covariates in people living with HIV. Results from the Liverpool Multiparametric Imaging Collaboration

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Background
- Patients living with HIV are at 1.5-2 times increased risk of myocardial infarction compared to risk matched non-HIV populations.
- A significant contribution to this risk is chronic inflammation, insulin resistance and dyslipidaemia from ectopic fat deposition.
- Hepatosteatosis can be quantified via ultrasound, non-contrast computed tomography and magnetic resonance.
- HIV induced inflammation and ectopic fat deposition could be a significant contributor to the increased risk seen in this cohort.

Aims
- To assess the association of hepatosteatosis and prevalent cardiovascular disease (CVD) in patients living with HIV.

Methods
- Data was collected from the Liverpool Multiparametric Imaging Collaboration.
- Patients who had CT images of their thorax or abdomen for any indication from the last decade were included.
- Clinical and imaging covariates were compared in those with coronary calcifications and those without.

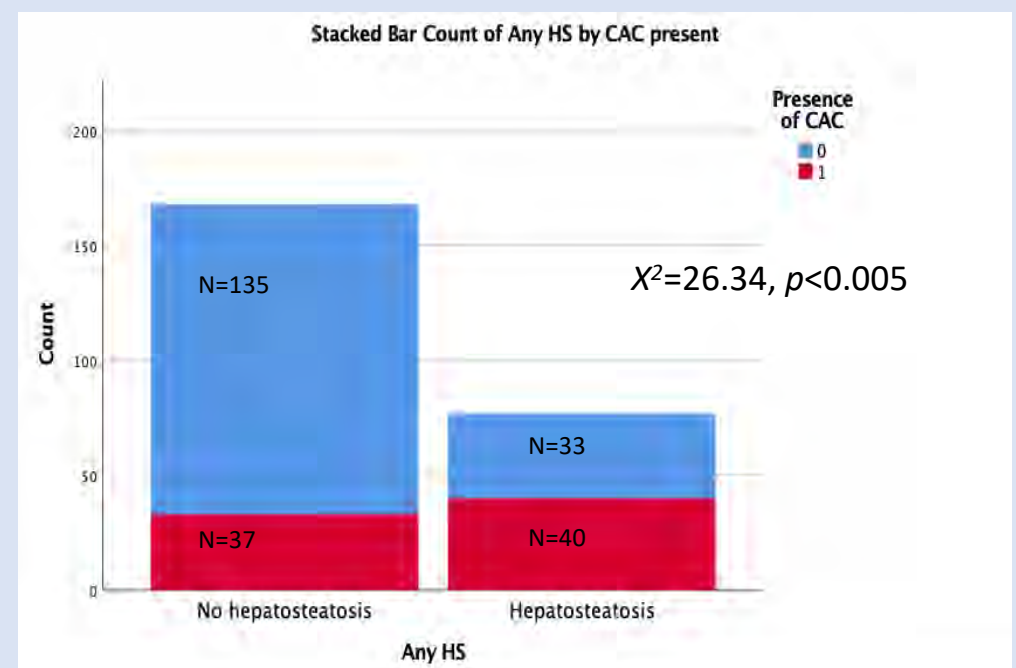## Example of coronary calcification and hepatosteatosis on non-contrast CT
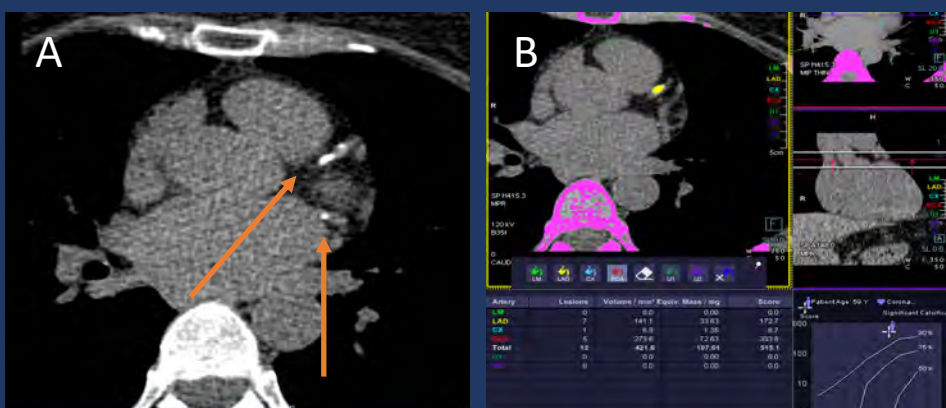
Panel A: Non-contrast gated with arrows showing coronary calcifications in the proximal LAD and circumflex

Panel B: semi-quantitative assessment of coronary calcium score

Panel C: Assessment of hepatosteatosis using two region of interests on the liver and one on the spleen. This allows calculation of the liver/spleen ratio.

Results
- 245 patients were included.
- Coronary calcifications were detected in 73 (29.8%).
- Increasing age (p<0.005), male sex (p<0.005), renal dysfunction (p=0.017) and dyslipidaemia (p=0.007) were significantly associated with the presence of coronary calcifications.
- Increased triglyceride levels and lipid ratios and decreased high density lipoprotein (HDL) were significantly associated with the presence of coronary calcification (p<0.05).
- In the final multivariate model increasing age (odds ratio 1.1, 95% CI: 1.04-1.16, p=0.001) and hepatosteatosis (odds ratio 3.46, 95% CI: 1.76-6.82 p<0.005) were the only clinical covariates associated with coronary calcifications.

X^2=26.34, p<0.005

Conclusions
- The presence of hepatosteatosis was the most significant predictor of coronary calcification even after adjustment for traditional risk factors.
- These findings highlight the unique pathophysiological role of ectopic fat deposition in development of cardiac disease.
- These findings are hypothesis generating and further study is required to fully elicit the interaction of HIV, ectopic fat and development of CVD.

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