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POSTER PRESENTATION

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# Epicardial fat volume is associated with coronary endothelium-dependent vasomotor response in healthy subjects

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## Introduction

Epicardial fat ( $E_{fat}$ ) is an active ectopic fat depot, directly surrounding coronary arteries, and secreting high level of inflammatory adipokines; its development has been associated with coronary atherosclerosis. We investigated the relationship between  $E_{fat}$  and endothelium dependent vasoreactivity of the coronary microcirculation.

## Methods

Myocardial blood flow (MBF) was determined by measuring coronary sinus flow with velocity-encoded cine magnetic resonance imaging at 3 teslas. We measured MBF at baseline and in response to sympathetic stimulation by cold pressor testing (CPT) in 17 healthy volunteers with normal left ventricular function (age  $24 \pm 6$  years, BMI =  $21.1 \pm 2.6$  kg/m<sup>2</sup>).  $E_{fat}$  volume was volumetrically assessed by manual delineation on short-axis views. CPT was applied by immersing one foot in ice water for 4 minutes.

## Results

A significant increase in MBF was observed:  $1.18 \pm 0.58$  vs  $0.84 \pm 0.47$  mL.min<sup>-1</sup>.g<sup>-1</sup>, CPT vs rest,  $p=0.002$ . Mean relative MBF increase ( $\Delta$ MBF) was  $50 \pm 47\%$ . Mean  $E_{fat}$  volume was  $82 \pm 31$  mL and varied from 43 to 131 mL; mean LV mass and Left ventricular ejection fraction were  $104 \pm 31$  g and  $64 \pm 5\%$ , respectively. CPT significantly increased heart rate (HR) by  $28 \pm 13\%$ , systolic blood pressure (BP) by  $17 \pm 13\%$ , diastolic BP by  $23 \pm 19\%$  and rate-pressure

product by  $52 \pm 25\%$ ,  $p < 0.01$ , indicating an increase in myocardial work load. The increase in HR, reflecting sympathetic stimulation, was not influenced by sex, age or  $E_{fat}$  volume. CPT induced a decrease in coronary vascular resistance ( $150 \pm 93$  vs  $114 \pm 44$  mmHg.mL<sup>-1</sup>.min.g) by trend ( $p=0.08$ ). Interestingly, we found a significant negative correlation between  $E_{fat}$  volume and  $\Delta$ MBF ( $r=-0.51$ ,  $p=0.03$ ), which remained significant after adjusting for age and sex.  $\Delta$ MBF was not associated with waist circumference, BMI, CRP, lipid or glycemic parameters.

## Conclusion

The increase in  $E_{fat}$  is associated with a decrease in endothelium dependent vasoreactivity response, suggesting that  $E_{fat}$  could early influence endothelial function.

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