Adiponectin and Vulnerable Coronary Plaques: a VH-IVUS study

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Intravascular Ultrasound Diagnostic Evaluation of Atherosclerosis in Singapore (IDEAS)

• To correlate anatomical and functional significance of intermediate lesions in small coronary artery (published)

• Relationship between HDL and coronary artery modeling (submitted)

• Relationship between adiponectin and vulnerable coronary plaque
• Obesity, particularly intra-abdominal (visceral) obesity, is a leading cause of cardiovascular disease (CVD), insulin resistance, type 2 diabetes, dyslipidaemia, inflammation and thrombosis.
Global Prevalence of Obesity (BMI ≥30)

The Fat Cell Is a Veritable Endocrine Factory

- Leptin
- Adiponectin
- Resistin
- Angiotensinogen
- IL-6
- TNF-Alfa
- Cortisol
- Stored Triglycerides

• A peptide hormone specifically produced by adipocytes
• Abundantly present in circulation
• Humans who are obese or who suffer from Type II diabetes show reduced levels of adiponectin

Protection from:
- Insulin-resistance
- Type 2 diabetes
- Coronary artery disease
Higher intimal thickening after injury in adiponectin knock-out mice

Effect of adenovirus-mediated supplement of adiponectin
Association of Hypoadiponectinemia With Coronary Artery Disease in Men

Adiponectin, clinical presentation and lesion complexity in patients with coronary artery disease

5.27 [3.67 - 8.12] vs. 4.14 [2.95 - 6.02]

p = 0.003

4.21 [3.36 - 5.41] vs. 3.26 [2.26 - 4.46]

p = 0.032

J Am Coll Cardiol 2006;48:1155– 62
Association of high-plasma adiponectin levels with CV death

Fibrous
Fibrofatty
Calcium
Necrotic core
Primary Objective

To compare the serum levels of adiponectin in patients with features of vulnerable coronary plaque

• Thin-capped fibroatheroma
• Positive remodeling
• Presented with acute coronary syndrome
Secondary Objectives

To study the relationships between serum levels of adiponectin and severity of coronary artery disease

• Number of vessel with >50% stenosis
• Percent atheroma volume

To study the relationships between serum levels of adiponectin and outcomes after PCI

• TIMI flow and corrected TIMI frame count
• PCI-related myocardial infarction
• One year clinical outcomes: Death, MI, TVR
Methods

• Patients who undergo coronary angiography and intervention for ischemic symptoms
  Stable angina / silent ischemia
  Unstable angina
  NSTEMI
  STEMI

• One identifiable culprit lesion

• VH-IVUS examination before balloon inflation (Thrombus aspiration is allowed)

• Serum adiponectin measured by ELISA
Exclusion Criteria

- Thrombus-laden lesion after thrombus aspiration
- Instent restenosis
- Saphenous vein graft lesion
- Severe calcification
- Significant left main disease
- Renal failure on dialysis
- Severe angulation / tortuosity
Summary of study methodology

Patents undergoing coronary angiography

Culprit lesion identified

VH-IVUS

Adiponectin

Number of vessel with >50% stenosis

Analyzed by an investigator blinded to patient characteristics and adiponectin level

PCI

TIMI flow, corrected TIMI frame count

One year clinical outcomes

Analyzed by in independent laboratory blinded to VH-IVUS data

National University Heart Centre, Singapore
Study Status

• Total of 78 patients have been recruited

• Expected completion date: December 2010

• Number of patient/lesion analyzed: 68

• TCFA +ve: 27 (39.7%), TFCA –ve: 41 (60.3%)

• Adiponectin level: 7.4 vs. 4.3 μg/ml (TCFA +ve vs TCFA –ve, p=0.08)