Multi-vessel Coronary Function Testing increases diagnostic yield in INOCA

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Background: Coronary vasomotor disorders (CVDs), comprising endotypes of coronary spasm and/or microcirculatory impairment, are common amongst patients with ischaemia and no obstructive coronary arteries (INOCA). Invasive coronary function testing (CFT) is the gold standard for diagnosing CVDs [1]. Most institutions recommend only testing the left coronary circulation focusing on the left anterior descending (LAD) artery as it typically subtends the largest myocardial territory [2]. Current practice is based on consensus, and it is unknown whether testing multiple coronary territories will increase diagnostic yield.

Purpose: To evaluate the diagnostic yield of multi-vessel, compared to single-vessel CFT in patients with INOCA.

Methods: Multi-vessel CFT was systematically performed in patients with suspected CVD. Vasoreactivity testing was performed through acetylcholine provocation in the left (20-200mcg) and right (20-80mcg) coronary artery. Incremental doses were manually injected via a guiding catheter over 20 seconds. A pressure-temperature sensor guidewire was used for coronary physiology assessment in all three epicardial vessels (figure 1). Microvascular or vasospastic angina was diagnosed according to previously published international consensus.

Results: A total of 50 patients (57.5±12.8years with 60% females) and 147 vessels were included from 2 tertiary referral institutions. Compared to single-vessel CFT, multi-vessel testing resulted in more patients diagnosed with coronary vasomotor dysfunction (80% vs 62%, p = <0.0001), vasospastic angina (50% vs 38%, p = 0.04) and microvascular angina (58% vs 38%, p = 0.004) (figure 2). Epicardial vasospasm (n=25) predominated in the left coronary system (n = 19), though isolated right coronary spasm was noted in 20.7% (n=6). Over half the patients (n=28) had coronary microvascular dysfunction (CMD), 50% had 1-vessel CMD, 35.7% had 2-vessel CMD, 14.3% had 3-vessel CMD. CMD was observed at a similar rate in the territories supplied by all three major coronary vessels (LAD = 36%, LCX = 28%, RCA = 28%, p = 0.648).

Conclusion: Multi-vessel CFT resulted in an increased diagnostic yield in patients with INOCA when compared to single-vessel testing. The results of this study suggest that multi-vessel CFT has a role in the management of patients with INOCA.
Multi-vessel Coronary Function Testing

1. Diagnostic coronary angiography
   - No obstructive coronary arteries

2. Vasoreactivity testing
   - Acetylcholine
   - Monitor angiogram, symptoms, ECG

3. Diagnostic guidewire assessment
   - Adenosine
   - Thermodilution CFR and IMR

4. Branches
   - LCA
   - RCA
   - LAD
   - LCX
   - RCA

- Vasospastic Angina
- Microvascular Angina
- Vasospastic & Microvascular Angina
- Non-cardiac chest pain

Multi-vessel CFT algorithm
Diagnostic yield of multi-vessel CFT