Role of acetylcholine spasm provocation test in nonobstructive coronary artery disease

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The most common symptom of ischemic heart disease is angina pectoris. Ischemia with non-obstructive coronary artery disease (INOCA) is defined as presence of signs and symptoms of ischemia and coronary artery stenosis less than 50% on invasive coronary angiography. INOCA endotypes are microvascular angina (MVA), vasospastic angina (VSA) and mixed MVA and VSA. INOCA patients are more likely to be female aged 40 to 70 years. Smoking is a risk factor for vasospastic angina, while diabetes and hypertension are not[1]. The prognosis of patients with INOCA is not benign. Symptoms are often disabling, and patients have higher incidence of adverse cardiovascular events. Treatment of INOCA patients includes lifestyle modifications, management of common risk factors and antianginal medication. Acetylcholine is parasympathetic nervous system neurotransmitter. The ACh spasm provocation test has become a popular method for induction of coronary spasm. Due to rapid degradation by acetylcholinesterase ACh-provocation coronary spasm is short of duration. ACh is injected into coronary artery within 20 seconds with continuous monitoring of the ECG and patient's symptoms. ENCORE study protocol proposes incremental doses of 2, 20, 100, and 200 micrograms of ACh manually infused into the left coronary artery (LCA). In patients who remain asymptomatic 80 micrograms of ACh is injected into the right coronary artery. Bradycardia and atrio-ventricular block are often during test, but short of duration and usually resolve spontaneously within few minutes[2]. Results are based on three criteria. Symptoms such as chest pain or shortness of breath. Second are ECG changes such as ST segment elevation, depression, or T wave changes and third criteria are focal or defuse epicardial diameter reduction of 90% or more. If only first two criteria are met than microvascular angina is diagnosed. Serious complications such as myocardial infarction or ventricular tachycardia/fibrillation are reported in 0.3-1% of cases[3]. In conclusion, INOCA patients are often under-diagnosed, under-treated and because of that have worse prognosis. ACh spasm provocation should be performed in patient with specific anginal symptoms, evidence of ischemia and non-obstructive coronary artery disease to guide optimal treatment and improve quality of life.

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LITERATURE

1. Kunadian V, Chieffo A, Camici PG, Berry C, Escaned J, Maas AHEM, Prescott E, et al. An EAPCI Expert Consensus Document on Ischaemia with Non-Obstructive Coronary Arteries in Collaboration with European Society of Cardiology Working Group on Coronary Pathophysiology & Microcirculation Endorsed by Coronary Vasomotor Disorders International Study Group. EuroIntervention. 2021 Jan 20;16(13):1049-1069. https://doi.org/10.4244/EIJY20M07_01
2. Sueda S, Kohno H, Ochi T, Uraoka T. Overview of the Acetylcholine Spasm Provocation Test. Clin Cardiol. 2015 Jul;38(7):430-8. https://doi.org/10.1002/clc.22403
3. Ong P, Athanasiadis A, Sechtem U. Intracoronary Acetylcholine Provocation Testing for Assessment of Coronary Vasomotor Disorders. J Vis Exp. 2016 Aug 18;(114):54295. https://doi.org/10.3791/54295-v