Myocardial Perfusion Imaging Study of CO₂-Induced Panic Attack

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Chest pain is often seen alongside with panic attacks. Moreover, panic disorder has been suggested as a risk factor for cardiovascular disease and even a trigger for acute coronary syndrome. Patients with coronary artery disease may have myocardial ischemia in response to mental stress, in which panic attack is a strong component, by an increase in coronary vasomotor tone or sympathetic hyperactivity setting off an increase in myocardial oxygen consumption. Indeed, coronary artery spasm was presumed to be present in cases of cardiac ischemia linked to panic disorder. These findings correlating panic disorder with coronary artery disease lead us to raise questions about the favorable prognosis of chest pain in panic attack. To investigate whether myocardial ischemia is the genesis of chest pain in panic attacks, we developed a myocardial perfusion study through research by myocardial scintigraphy in patients with panic attacks induced in the laboratory by inhalation of 35% carbon dioxide. In conclusion, from the data obtained, some hypotheses are discussed from the viewpoint of endothelial dysfunction and microvascular disease present in mental stress response. © 2014 Elsevier Inc. All rights reserved. (Am J Cardiol 2014;113:384–388)

Chest pain is a key symptom in acute coronary syndrome, one of the leading causes of death in the world. Therefore, it requires accurate investigation for rapid identification and early treatment. In contrast, patients at emergency room complaining of chest pain may present symptoms of anxiety and depression with no evidence of acute coronary syndrome. Panic disorder (PD) is a frequent diagnosis in this population. It was found that around 30% of patients experiencing chest pain had PD, 22% of them with no evidence of coronary artery disease (CAD). As part of the multifactorial clinical picture known as mental stress (MS), PD is characterized by the occurrence of panic attacks (PAs), periods of intense fear accompanied by somatic symptoms, described as “respiratory symptoms,” which include choking and/or smothering sensations, shortness of breath, chest pain, and palpitation or accelerated heart rate (HR), all of them possibly present in acute coronary syndrome. Intriguingly, in addition to mimicking CAD, PD has also been identified as a risk factor for ischemic events. Several cases of PA triggering myocardial infarction have been reported. Of interest, acute stress has been linked to myocardial damage even in patients without any evidence of obstructive CAD. The aim of this study is to better assess chest pain present in PA, to exclude the presence of myocardial ischemia. To address this aim, we designed a clinical study in patients with PD and chest pain without known CAD. Here, we describe the preliminary results.

Methods

The present study was approved by the Institutional Ethics Committee, consistent with the terms of Declaration of Helsinki. Written informed consent was obtained from all patients. After testing, all patients were followed at regular outpatient PD treatment at our institution.

The patients met diagnostic criteria for PD after completing a structured interview based on the Diagnostic and Statistical Manual for Mental Disorders. The inclusion criterion was to have a minimum of 4 PAs, at least 1 of which was unanticipated, during the 4 weeks before the initiation of the evaluation. All patients also need to report chest pain, defined as chest pressure, pain, or discomfort, concomitantly with most of attacks. The exclusion criteria were CAD diagnosis, coronary risk factors, and use of cardiovascular, antipsychotic, antidepressant, regular benzodiazepine, or non-benzodiazepine anxiolytic medication.

To rule out myocardial ischemia induced by physical stress, the patients were subjected to a technetium-99m sestamibi single-photon emission computed tomography (spectamibi SPECT) investigation at rest and after maximum performance during a treadmill exercise test. Those with negative ischemic response were invited to undergo