# 急性STEMI後のIABCによる有益性は認められない

急性STEMI患者に対する大動脈内バルーンカウンターパルゼーションの使用は梗塞サイズを減少させないようである

CRISP AMI: Use of intra-aortic balloon counterpulsation for patients with acute STEMI does not appear to reduce infarct size

急性ST上昇心筋梗塞（STEMI）患者における大動脈内バルーンカウンターパルゼーション（IABC）使用による経皮的冠動脈形成術（PCI）前後の血流増加は永続的な傷害を受ける心筋量を軽減させないとのスタディ結果が、2011年European Society of Cardiology学会において発表されJAMAオンライン版に掲載された。カウンターパルゼーションによるPCI前急性心筋梗塞の梗塞サイズ軽減（Counterpulsation to Reduce Infarct Size Pre-PCI Acute Myocardial Infarction：CRISP AMI）のスタディには337人の患者を組み入れ、プライマリPCI前にIABCを施行し12時間以上継続する群（IABC＋PCI）またはプライマリPCIのみを受ける群に無作為に割り付けた。IABC＋PCI群とPCI単独群とでは平均の梗塞サイズに有意差はなかった（それぞれ42.1%と37.5%）。次に心臓MRIの結果は梗塞サイズの結果と一致しており、IABC＋PCI群およびPCI単独群において平均微小血管閉塞はLV心筋量のそれぞれ6.8%および5.7%であった。これらの結果は、ガイドラインにおいて大動脈内カウンターパルゼーション使用が推奨されている心原性ショックの患者とは異なり、ハイリスクSTEMI患者に対するプライマリPCI時のIABCの（ルーチン使用ではなく）スタンバイでの使用を支持するものである。

## Full Text

Among patients with acute ST-segment elevation myocardial infarction (STEMI), the use of intra-aortic balloon counterpulsation (IABC) to increase blood flow before and after a percutaneous coronary intervention (PCI) did not result in a reduction in the amount of heart muscle permanently damaged, according to a study presented at the 2011 European Society of Cardiology Congress and simultaneously published online in JAMA.

"Patients with acute STEMI, representing 30 percent to 45 percent of approximately 1.5 million hospitalizations for acute coronary syndromes annually in the United States, are still at substantial acute mortality risk with 1-year mortality estimated to be between 6 percent and 15 percent. This may be related to microvascular obstruction resulting in no reflow at the time of mechanical reperfusion and infarct expansion over time," according to background information in the article. Intra-aortic balloon counterpulsation (IABC) mechanically increases coronary blood flow with the use of a balloon in the aorta. Some observational studies have suggested a possible clinical benefit in patients with high-risk STEMI receiving IABC prior to reperfusion with PCI and stenting, with increased clinical use at an early stage in the U.S.

Manesh R. Patel, M.D., of the Duke Clinical Research Institute, Duke University Medical Center, Durham, N.C., and colleagues conducted a trial to determine if IABC inserted prior to primary PCI compared with primary PCI alone (standard of care) reduced infarct size in patients with acute anterior STEMI without cardiogenic shock. The randomized controlled trial, the Counterpulsation to Reduce Infarct Size Pre-PCI Acute Myocardial Infarction (CRISP AMI), which included 337 patients, was conducted at 30 sites in 9 countries from June 2009 to February 2011. Patients were randomized to receive IABC prior to primary PCI, and IABC was continued for at least 12 hours (IABC plus PCI), or patients received primary PCI alone. The primary measured outcome was infarct size, expressed as a percentage of left ventricular (LV) mass and measured by cardiac magnetic resonance imaging (MRI). Secondary outcomes included all-cause death at 6 months and vascular complications and major bleeding at 30 days.

The researchers found that the average infarct size was not significantly different between patients in the IABC plus PCI group and the PCI alone group (42.1 percent vs. 37.5 percent, respectively). And in higher-risk patients with other certain cardiac characteristics (proximal left anterior descending Thrombolysis in Myocardial Infarction flow scores of 0 or 1), the findings were similar (46.7 percent vs. 42.3 percent, respectively). Secondary cardiac MRI findings were consistent with the infarct size findings, including average microvascular obstruction of 6.8 percent vs. 5.7 percent of LV mass for the IABC plus PCI group and the PCI alone group, respectively.

"At 30 days, there were no significant differences between the IABC plus PCI group and the PCI alone group for major vascular complications and major bleeding or transfusions• cBy 6 months, 3 patients (1.9 percent) in the IABC plus PCI group and 9 patients (5.2 percent) in the PCI alone group had died," the authors write. The time to the composite end point of death, recurrent heart attack, or new or worsening heart failure at six months was not significantly different between the 2 groups.

The researchers write that unlike patients with cardiogenic shock for whom guidelines recommend intra-aortic counterpulsation, patients with high-risk anterior STEMI without shock do not seem to garner a reduction in infarct size from early routine use of IABC. "Clinicians should continue to be vigilant about identifying patients who are at risk for rapid deterioration and who may benefit from counterpulsation (as seen with the crossover in this trial). Future studies should be aimed at identifying the patient features associated with early deterioration."

"These findings support a standby strategy (rather than routine use) of IABC during primary PCI in high-risk anterior STEMI patients."

In an accompanying editorial, Gjin Ndrepepa, M.D., and Adnan Kastrati, M.D., from Deutsches Herzzentrum, Technische Universitat, Munich, Germany, write that the "issue of the use of IABC during high-risk PCI procedures or in STEMI remains controversial, " but that the study by Patel and colleagues in this issue of JAMA helps to clarify this controversy."

"The clear-cut message from the CRISP AMI trial is that among patients with STEMI without cardiogenic shock, the routine use of IABC neither reduces infarct size nor improves clinical outcome; accordingly, use of this device should be discouraged in these patients."

"Other research avenues for the treatment of patients with STEMI remain attractive. Organizational efforts to increase the availability of primary PCI and reduce ischemia time remain of paramount clinical importance," they conclude.

## Conference News