血液バイオマーカーがMI否定に有望であることが示された

高感度心筋トロポニンTは胸痛患者の心筋梗塞リスク予測に役立つ

High-sensitivity cardiac troponin T helps predict myocardial infarction risk for patients with chest pain

救急外来受診患者のうち、血液バイオマーカーである高感度心筋トロポニンT（*hs*-cTnT）が不検出レベルで心電図上虚血の所見のない者は、30日以内の心筋梗塞（MI）リスクが極小であるとの研究結果が第63回American College of Cardiology学会で発表され、*Journal of the American College of Cardiology*オンライン版に掲載された。胸痛を主訴にスウェーデンの救急外来を受診し、初回検査でこのバイオマーカーが不検出レベル（< 5ng/L）であり、ECG上虚血による心筋傷害の所見のない患者約9,000人（平均年齢47歳、女性53%）がスタディに組み入れられた。30日以内に39人がMIと診断され、うち15人はECG上心筋傷害の所見がなかった。したがって、胸痛で医療機関を受診したがECG上心筋傷害所見がなく*hs*-cTnT不検出レベルの患者のうち実際に直後のMIリスクを有するのは、594人にわずか1人である。この検査のMIに対する陰性的中率は99.8%であり、死亡に関しては100%であった。この相関関係は、患者のリスクファクターや症状の持続時間に関係なく維持された。

Full Text

Patients presenting to the emergency department with an undetectable level of the blood biomarker high-sensitivity cardiac troponin T (*hs*-cTnT), and whose ECGs show no sign of restricted blood flow, have a minimal risk of myocardial infarction (MI) within 30 days, according to research presented at the American College of Cardiology's 63rd Annual Scientific Session.

In a study of all patients (14,636 in total) reporting to a Swedish emergency department with chest pain over a two-year period from 2010 to 2012, researchers examined patients' blood levels of *hs*-cTnT, a marker that indicates damage to the heart. Nearly 9,000 patients with an undetectable level of the biomarker, or less than 5ng/L, on initial testing, and whose ECGs showed no heart damage from decreased blood flow, were included in the study to examine the primary endpoint of MI within 30 days. Researchers found that the negative predictive value of the tests – the probability that patients are not at risk – was 99.8 percent for MI and 100 percent for death. This relationship held true regardless of patients' risk factors for MI or how long patients had experienced symptoms.

"Chest pain is a potentially life-threatening symptom, as well as being a very common one," said Nadia Bandstein, M.D., Department of Medicine, Karolinska Institute, Solna, Sweden, and the lead investigator of the study. "In our hospital it's the second most common symptom reported in the emergency department. Since there are no established ways to quickly rule out MI, many patients are admitted to the hospital unnecessarily, at a large cost to the patient and to society."

According to Bandstein, this is the first large study to specifically examine the use of *hs*-cTnT to predict MI risk. The impetus for the study stemmed from the hospital clinicians' observations that patients with undetectable levels of the marker who were admitted to the hospital almost never went on to have MIs or need any further work-up, and most went home within a day of admission.

High-sensitivity cardiac troponin T is a relatively new biomarker used in the diagnosis of MI and is detectable in the blood several hours before older methods of measuring troponins. Current guidelines recommend that *hs*-cTnT be analyzed at least three hours after the onset of chest pain, which commonly means that patients need to be admitted to the hospital for a second blood test and further evaluation. Bandstein says these study findings suggest that only one measure of the biomarker needs to be taken, and may allow some patients to be discharged directly from the emergency department.

"Despite our observations before the study, we were still surprised by the strength of our findings," Bandstein said. "Using this blood test along with an ECG, we will save about 500 to 1,000 admissions per year in our hospital alone, allowing us to use the beds for sicker patients."

Authors believe this study also has tremendous implications for the millions of patients around the world who seek emergency treatment for chest pain each year.

During the 30 days of follow-up, 39 of the 8,907 patients were diagnosed with MIs, and 15 of these patients showed no signs of damage on ECG. What this means, according to researchers, is that only one in 594 patients who seek medical attention for chest pain – but have no signs of heart damage on an ECG and undetectable levels of *hs*-cTnT – are actually at immediate risk of MI. The average age of patients in the study was 47, and 53 percent were women.

Bandstein recommends that further research be done to assess the risk of heart attack among patients with slightly higher levels of *hs*-cTnT (5-14 ng/L). It will also be important to look at the prognosis for patients diagnosed with heart attack based on slight elevations of the biomarker, she said.

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