LETTER TO THE EDITOR

Increased lung uptake of radioactive tracers for the prediction of left main coronary artery disease: How reliable?

To the Editor,

We have greatly enjoyed reading the recently published article entitled 'Important parameters in the detection of left main trunk disease using stress myocardial perfusion imaging' [1]. In that well-designed study the authors tried to search noninvasively to diagnose left main trunk (LMT) disease using myocardial perfusion imaging (MPI). Five hundred and eight patients with suspected coronary artery disease (CAD) underwent both stress MPI and coronary angiography. Logistic regression analysis showed that a three-vessel pattern defect (OR = 3.5), lung uptake of radiotracers (OR = 2.5), and previous myocardial infarction (MI) (OR = 2.4) were the most important parameters to detect LMT disease. After excluding 163 patients with previous MI, a repeat analysis revealed that lung uptake of radiotracers (OR = 8.2) and an LM-pattern defect (OR = 6.3) were independent predictors for LMT disease. They concluded that in the identification of LMT disease, lung uptake of radiotracers was the single best parameter, which was independent of the presence or absence of previous MI.

Increased lung uptake of thallium reflects increased pulmonary capillary wedge pressure [2]. On the other hand, nonischemic causes of increased pulmonary capillary wedge pressure, such as mitral regurgitation, mitral stenosis, and so on, are also associated with increased pulmonary thallium uptake. Increased thallium lung uptake after exercise has been shown to have incremental prognostic information over myocardial perfusion defect assessment [3]. The prognostic value of increased pulmonary uptake of $^{99m}$Tc-sestamibi has also been reported [4].

Although the current article provided essential data for the prediction of LMT disease we strongly believe that there are some critical points that deserve to be mentioned. First, in the methods section of the manuscript, it was stated that ‘‘The accumulation of radiotracers in the myocardium was visually evaluated by two cardiologists using a 5-grade scale: 0 (normal), 1 (slight reduction of uptake), 2 (moderate reduction of uptake), 3 (severe reduction of uptake), or 4 (absence of radioactive uptake)’’. Actually myocardial perfusion imaging studies would be expected to be reviewed by experienced nuclear medicine specialists or nuclear cardiologists instead of two cardiologists. It has been reported that there is moderate to excellent interpretive reproducibility with stress $^{99m}$Tc-sestamibi single photon emission computed tomography imaging among nuclear cardiologists with a wide range of training and experience [5]. Besides it has also been reported that segmental scoring reproducibility with $^{99m}$Tc-sestamibi MPI was moderate to good [6]. We also believe that information gathered from the data must be interpreted under the light of experience to avoid pitfalls of the technique.

Another important point is the evaluation of the lung parenchyma of the study group. We suggest that the study participants should be assessed by a simple chest X-ray. Whereas, the authors concluded that ‘‘in the interpretation of MPI for the better detection of LMT disease, the investigator should focus not only on myocardial perfusion pattern, but also on lung uptake of radiotracers, regardless of study protocol or tracers used’’. Since both thallium-201 and $^{99m}$Tc-sestamibi are nonspecific tracers and both show increased uptake in benign and malignant lung pathologies [7,8] we believe that reaching the conclusion stated above may be misleading without evaluating the lung parenchyma of the study group. Lastly it should be kept in mind that $^{99m}$Tc-sestamibi lung/heart ratios are higher in smokers compared to those of nonsmokers [9].

References


Turgay Celik (MD)\textsuperscript{a}, Ozgur Karacalioglu (MD)\textsuperscript{b}

\textsuperscript{a}Department of Cardiology, Gulhane School of Medicine, Gulhane Military Medical Academy, General T evfik Saglam Street, 06018 Etilik-Ankara, Turkey

\textsuperscript{b}Department of Nuclear Medicine, Scholl of Medicine, Gulhane Military Medical Academy, General T evfik Saglam Street, 06018 Etilik-Ankara, Turkey

\textsuperscript{*}Corresponding author.

E-mail address: benturgay@yahoo.com

(T. Celik)

doi:10.1016/j.jjcc.2009.02.006

Author’s reply

Drs Celik and Karacalioglu raised interesting points concerning our study published in a recent issue of the Journal, which showed that lung uptake of radionuclides was a single best parameter in the identification of left main trunk (LMT) disease among 508 patients with suspected or known coronary artery disease (CAD) [1]. The questions they raised concerned a potential effect of concomitant pulmonary disease on lung uptake of radionuclides and reliability of a 20-segment scoring system on myocardial SPECT imaging.

In patients with chronic pulmonary disease, diffuse lung uptake of radionuclide is often observed on SPECT image both after stress and at rest [2]. In contrast, lung uptake of radionuclide in patients with extensive and severe CAD such as LMT disease is observed only after exercise or pharmacologic stress [1,3]. Lung uptake of radionuclide disappears on the delayed SPECT image. The definition of lung uptake has been clearly stated in our study [1]. In addition, patients with severe valvular heart disease were excluded from the study. Thus, potential confounding effects due to pulmonary or valvular disease seem negligible.

In the evaluation of myocardial SPECT image including a 20-segment scoring system, two cardiologists with vast experience of this methodology contributed. In addition, our institution has been involved in the J-ACCESS study, in which interinstitutional reproducibility of SPECT imaging has been affirmed [4]. Nevertheless, we concur with Drs Celik and Karacalioglu in that before applying our study in clinical practice, a learning curve should be taken into consideration to avoid pitfalls of this technique.

References


Chie Shiba MD\textsuperscript{*}, Taishiro Chikamori (MD, FJCC)\textsuperscript{*}

\textsuperscript{*}Corresponding authors.

E-mail address: chikamd@tokyo-med.ac.jp

(T. Chikamori)

doi:10.1016/j.jjcc.2009.02.018