

Looking at the whole picture

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Received Jan 26, 2015; accepted Jan 26, 2015
doi:10.1007/s12350-015-0085-8

See related article, pp. 888–900

Since coronary artery disease (CAD) is a chronic progressive disease long-term risk assessment is an important but also very challenging issue. A lot of data are available regarding risk stratification in patients with chronic CAD¹⁻³ also addressing the warranty period of a normal scan.⁴⁻⁶ The perfusion results (as summarized in the summed stress, rest and difference scores) are one important part of risk stratification. But overall, the covariates play an important role. Several factors modify the warranty period of a normal scan, e.g., type of stress and left ventricular ejection fraction.⁵ In the current issue of the Journal, Veenis et al report on the 14 years median follow-up of patients who had undergone dobutamine myocardial perfusion imaging (MPI) because of a limited exercise capacity.

Their conclusions are that dobutamine MPI provides incremental prognostic information for the prediction of cardiovascular outcomes in patients with limited exercise capacity and that prognosis of patients with abnormal MPI is significantly worse than that of patients with normal MPI.

One of the strengths of the study is the long follow-up period with an extremely good follow-up rate of 99.7%. Only two patients were lost to follow-up.

On the other hand, the population that was enrolled was a very selected one. This is underscored by the fact that only 120 patients per year were suitable for inclusion into the analysis. In general, patients who undergo pharmacologic stress testing because of the inability to perform an adequate physical stress test are known to have a worse prognosis than patients who are able to perform a physical stress test irrespective of perfusion

results.⁷ The necessity to undergo a pharmacologic stress test seems to be a surrogate marker for an overall worse health condition and an unfavorable outcome.⁷ At our institution less than 5% of patients undergo dobutamine stress testing; 95% undergo bicycle, combined adenosine/bicycle or adenosine only stress test. Patients who undergo dobutamine stress testing are mostly very sick patients.

As expected, in the current study, patients with limited exercise capacity and an abnormal MPI had a significantly worse event-free survival than patients with a normal MPI. This held true with respect to all-cause mortality, cardiac mortality, cardiac mortality and non-fatal mortality, and major adverse events.

On the other hand, the authors mention the high (overall) mortality rate even in patients with normal MPI. The event rate was much higher than expected based on general life expectancy data and data reporting normal MPI results.⁸

The event rates in the current study were high, irrespective of the MPI findings. The average annual mortality rate in the Netherlands is 0.8% and the mean life expectancy 81.5 years (www.indexmundi.com; 3.1.2015). Most patient populations with a normal MPI have mortality rates of less than 1%.⁸ In the current study, the annual all-cause mortality at 15 years follow-up was 3.2% and 3.9% in patients with normal and abnormal MPI, respectively, lower than after 5 and 10 years follow-up. The event rate difference between patients with normal and abnormal perfusion findings becomes smaller over time. The higher mortality rate in the current study in patients with normal perfusion compared to the general population and populations with normal MPI in other studies may point to the fact that the patients suffered also from non-cardiac health problems potentially leading to death.

Thus, perfusion findings (normal vs abnormal MPI) seem to risk stratify patients rather in the early years after testing than later on. Later the extent of coronary artery disease progression and other factors seem to become more important. This observation is also underscored by the fact that the landmark analysis revealed no significant difference in survival between patients with a normal and an abnormal dobutamine MPI regarding mortality after 4

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J Nucl Cardiol 2015;22:901–2.
1071-3581/\$34.00

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years of follow-up. Furthermore, perfusion variables were not consistently predictive of adverse events in the different models of the multivariate analyses. In contrast, age, gender, some patient history and risk factor variables were, Looking at the whole picture, therefore seems to be crucial for long-term risk stratification and risk prediction.

Disclosure

No conflict of interest to declare.

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