Heart disease

Dear Editor,

We read with interest the article authored by Lee et al on myocardial perfusion scans (MPS; *AFP* August 2013)[1] and were surprised that the significant radiation dose associated with these tests was not highlighted. Recent large studies in Australia and the United Kingdom have demonstrated that exposure to low-dose medical radiation (even a single CT scan) is associated with an increased incidence of future cancer.[2,3] In the Australian study, there were 608 excess cancers in 680,000 young people who underwent a CT scan during the follow-up period of 9.5 years, the average effective radiation dose per scan being 4.5 mSv.[2] Awareness of the radiation dose from medical procedures and investigations is important for all medical practitioners so that we can minimise risk to our patients.

The average radiation dose administered with MPS is 7–24 mSv,[4] with the higher doses reflecting rest–stress imaging with dual isotopes. An average MPS with an effective dose of 16 mSv is equivalent to 800 chest X-rays, assuming 0.02 mSv for a single posterioanterior chest X-ray. This is significantly higher than an invasive diagnostic coronary angiogram, averaging 7 mSv.[4]

In this era of multi-modality cardiovascular imaging there are many alternatives to MPS for the diagnosis and monitoring of coronary artery disease and the majority of these tests are associated with a lower radiation dose. As indicated in the article, stress echocardiography has no associated radiation burden, nor has stress perfusion MRI, although the latter test is not yet widely available.

One modality not discussed in the article is computed tomography coronary angiography (CTCA). Although radiation doses with CTCA can vary widely, depending on the equipment and the institution, it is now possible in expert centres to perform CTCA for 1–2 mSv. This provides both a lower radiation dose than myocardial perfusion scanning and a superior negative predictive value for the exclusion of coronary artery disease.

We encourage all medical practitioners to be cognisant of the 'radiation cost' of the investigations that they are requesting and the cumulative effect of repeat testing to ensure the highest diagnostic yield for the radiation delivered.

Dr Loretta Carr
Cardiology Registrar
Royal Brisbane and Women's Hospital
Dr John Younger
Senior Staff Cardiologist
Royal Brisbane and Women's Hospital

References

1. Lee JC, West MJ, Khafagi FA. Myocardial perfusion scans. Aust Fam Physician 2013;42:564–67.
2. Matthews JD, Forsythe AV, Brady Z, et al. Cancer risk in 680 000 people exposed to computed tomography scans in childhood or adolescence: data linkage study of 11 million Australians. BMJ 2013;346:f2360
3. Pearce MS, Salotti JA, Little MP, et al. Radiation exposure from CT scans in childhood and subsequent risk of leukaemia and brain tumours: a retrospective cohort study. Lancet 2012;380:499–505.
4. Einstein A. Radiation risk from coronary artery disease imaging: how do different diagnostic tests compare? Heart 2008;94:1519–21.

Reply

Dear Editor

We thank Drs Carr and Younger for their interest in our article.[1] We share their concerns about exposure to ionising radiation, particularly in young people. We have previously compared radiation dosimetry among imaging modalities in other articles in this series,[2] but space constraints did not permit such a discussion in the present article, other than to mention that stress echocardiography does not involve ionising radiation. It should be noted that patients who have cardiac investigations are typically older and hence the concern for radiation-induced cancer is somewhat less.

Carr and Younger indicated a wide range of effective radiation doses associated with myocardial perfusion scanning (MPS). The upper range (up to 24 mSv) relates to protocols using thallium-201, which is now rarely used in Australian practice – effective doses for MPS using technetium-99m-labelled agents should not exceed 12 mSv. Further, a variety of improvements in nuclear medicine camera hardware and software implemented in recent years[3] and the increasing use of stress-only MPS can reduce effective doses to less than 5 mSv.

Reference was also made to newer modalities such as CT coronary angiography (CTCA) and perfusion MRI. At present, Medicare reimbursement for CTCA is limited to specialist referral and perfusion; MRI is neither widely available nor reimbursable through Medicare. Thus, patients cannot be reimbursed for these services if referred by general practitioners, who constitute the main readership of this journal.

Dr Joseph C Lee
Professor Malcolm J West
Dr Frederick A Khafagi

References

1. Lee JC, West MJ, Khafagi FA. Myocardial perfusion scans. Aust Fam Physician 2013;42:564–67.
2. Lee JC, Harris AM, Khafagi FA. Thyroid scans. Aust Fam Physician 2012;41:584–86.
3. Slomka PJ, Patton JA, Berman DS, Germano G. Advances in technical aspects of myocardial perfusion SPECT imaging. J Nucl Cardiol 2009;16:255–76.

Letters to the Editor

Letters to the Editor can be submitted via:
E-letters: www.racgp.org.au/afp
Email: afp@racgp.org.au
Mail: The Editor, Australian Family Physician
100 Wellington Parade
East Melbourne VIC 3002 Australia

Correction

In the article 'Oral glucose tolerance testing' (*AFP* June 2012, pp391–93), Table 1 incorrectly states that no diabetes is present if fasting OGTT is ≥6.0 mmol/L. The correct interpretation is that no diabetes is present if fasting OGTT is ≤6.0 mmol/L.