INAHTA Briefs

Issue 2007/116

Title **A Systematic Review of Duplex Ultrasound, Magnetic Resonance Angiography and Computed Tomography Angiography for the Diagnosis and Assessment of Symptomatic, Lower Limb Peripheral Arterial Disease**

Agency **NCCHTA, National Coordinating Centre for Health Technology Assessment**
Mailpoint 728, Boldrewood, University of Southampton, Southampton SO16 7PX, United Kingdom;
Tel: +44 2380 595586, Fax: +44 2380 595639

Reference Health Technol Assess 2007;11(20). May 2007. www.hta.ac.uk/execsumm/summ1120.htm

Aim

To determine the best method, or combination of methods, to diagnose and assess symptomatic lower limb peripheral arterial disease (PAD).

Conclusions and results

The review suggests that contrast-enhanced MRA (CE-MRA) is more accurate than computed tomography angiography (CTA) or duplex ultrasound (DUS), and is preferred by patients over conventional angiography (CA). Where available, CE-MRA may be a viable alternative to CA. The only controlled trial suggested that DUS was comparable to CA in terms of surgical planning and outcome, conflicting with poor estimates of accuracy for DUS compared to CA.

Economic modeling suggests that when the whole leg is assessed, DUS dominates its alternatives, (higher effectiveness, lower cost/QALY). When assessment is limited to above or below knee, results vary, for above-the-knee 2D time-of-flight (TOF) MRA appears most cost effective, followed closely by CE-MRA. For below-the-knee comparisons results were less certain, with results suggesting that DUS could be the more cost-effective option, followed by 2D-TOF MRA.

Recommendations

It is recommended that a patient simulation model, considering the above issues, assess the long-term cost effectiveness of preoperative imaging diagnostic tests for PAD patients.

Methods

See Executive Summary link above.

Further research/reviews required

Questions requiring further research include: What is the relative clinical effectiveness of the available imaging tests, in terms of surgical planning and postoperative outcome? What adverse events result from testing, and what is the relative incidence for the available tests? Which tests do patients prefer? What is the true diagnostic accuracy of DUS in detection of ≥50% stenoses and occlusions, and how is this affected by timing of the test and operator skill? What are the effects of operator skill, etc on measures of test accuracy for the imaging modalities of interest? What is the diagnostic accuracy and clinical effectiveness of tests to image arteries in different areas of the leg, particularly the foot? What is the diagnostic accuracy and clinical effectiveness of tests in particular patient subgroups, eg, diabetes mellitus?

Data on how patients are managed after diagnostic results are obtained are required to populate the economic model. It is unclear whether the prognosis and quality of life of patients who had an inaccurate treatment plan and underwent a change of procedure, would differ significantly from patients that were correctly diagnosed and managed from the outset. Research on these topics is required.

If the allocation of treatment pathway were to be modeled, research would be required to allow these decisions to be captured and accurately represented. Such a model would reflect different treatment plans to be performed according to the specific clinical characteristics of patients obtained by means of the preoperative diagnostic testing. Hence, the model should consider the choice of treatments available and, based on test results, the treatment chosen by the clinicians.

Written by Miss Ros Collins, University of York, United Kingdom

ISSN 1654-501X