Coronariografía por Tomografía Computarizada Multicorte. Metaanálisis y estudio coste-e efectividad

Multi-slice computerised tomography coronary angiography in detecting coronary stenosis Meta-analysis and economic report. Executive summary.
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Multi-slice computerised tomography coronary angiography in detecting coronary stenosis. Meta-analysis and economic report. Executive summary
Executive summary

**Title:** Multi-slice computerised tomography coronary angiography in detecting coronary stenosis. Meta-analysis and economic report.

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**Rationale**

Multi-slice computerised tomography (MSCT) is being proposed as non-invasive alternative in coronary disease diagnosis, mainly to identify patients with no coronary disease subject to revascularization. Given the great development the procedure is experiencing and the change that its introduction within the National Health System would mean in terms of reduction in the number of invasive angiographies, the aim has been assessing the diagnostic accuracy of devices with 16 and 64 slices scanners in detecting stenoses in coronary arteries.

**Objectives**

To determine the test’s capacity to rule out the disease through weighted estimate of performance diagnostics parameters as for the 16 slices equipment as the 64 one, as well as to determine direct, real costs related to performing MSCT of 16 and 64 detection slices and invasive coronary angiography and evaluating the cost-effectiveness ratio.

**Methods**

Systematic review of literature by looking-up on MEDLINE and PreMEDLINE (1999-2006), EMBASE (2002-2006) reference databases and the clinical trials registry of Cochrane Library. Other sources were also reviewed such as: Food and Drug Administration, The International Information Network on New and Changing Health Technologies, International Network of Agencies for Health Technology Assessment, the North-American clinical trials registry, the database of the Centre for Reviews and Dissemination, and the National Research Registry. In addition, a handy search was done on Agency for Healthcare Research and Quality’s (Technology Assessments) website, as well as a secondary review of the papers selected. The studies comparing MSCT versus invasive angiography to diagnose stenotic lesions in coronary vessels, and including data related to goodness of fit of the test (sensitivity, specificity, positive and negative predictive
values) were selected. To reduce clinical and statistical variety, the studies retrieved were grouped together according to the type of analysis conducted: all segments; segments that had been assessed, i.e. those that had not presented artefacts that prevented its proper visualisation in MSCT; every patient and only the patients with assessable segments. QUADAS tool was used to assess the quality of the studies. The weighted summary of the results was conducted by means of a meta-analysis. The soundness of the findings was studied further by a sensitivity analysis. In the economic report, a cost-effectiveness analysis was conducted by using a decision tree model to determine the incremental cost-effectiveness ratio (ICER) of the strategies: invasive coronary angiography, as well as 16 and 64 slices MSCT. The costs were estimated according to the cost per activity, and the effectiveness measures of a systematic review of literature.

**Results**

30 studies assessing 16 scanner equipments were retrieved. 4 of them evaluated 64 slices equipments and there is also a technology assessment report. Although the quality of the studies was mostly good, they presented methodological flaws related to selection of patients with high prevalence of the disease, vessels with small calibre’s exclusion or with low imaging quality and the unit of analysis based on the segments. The studies evaluating 16 scanner equipments on the basis of the number of patients (N=757) reached the following figures for sensitivity, specificity, positive and negative verisimilitude ratio 0.94 (CI95%=0.92-0.96), 0.78 (CI95%=0.72-0.83), 4.37 (CI95%=2.74-6.98) and 0.07 (CI95%=0.03-0.16), respectively. The parameters for 64 slices equipments (N=188) were: 0.98 (CI95%=0.94-0.99), 0.94 (CI95%=0.84-0.98), 12.92 (CI95%=5.47-30.53) and 0.03 (CI95%=0.01-0.08), respectively.

The average costs of MSCT strategies of 16 and 64 slices were 203.96 € and 259.06 €, respectively, while for invasive coronary angiography was 307.85 €. The 16 MSCT strategy is mastered. However, the ICER of invasive coronary angiography for 40% prevalence of coronary disease was 16.596 € and 8.206 € for found and effective cases, respectively. In the sensitivity analysis, it is observed that ICER per case found ranged between 37.425 € -with prevalence of 25%- and 396 € -with 75% prevalence- for invasive coronary angiography when the prevalence of coronary stenoses patients was modified. The cases found were taken as effectiveness measure. Likewise by taking the effective cases as effectiveness measure, ICER for invasive coronary angiography ranged between 18.505 € and 196 € for 25 and 75% of prevalence, respectively.
Conclusions

The procedure is highly capable of ruling out the coronary disease in population, above all the 64 slices equipments as performed in population with high disease prevalence. Nonetheless, it does not visualize the coronary tree wholly, it has some adverse effects and results in health or changes in managing patients were left unstudied. The selection of the most cost-effective test depends on the context it is performed in. The most cost-effective strategy was 64 slices MSCT for prevalences of 56% and invasive coronary angiography for prevalences of 70%.