Cost effectiveness and screening interval of lipid screening in Hodgkin's lymphoma survivors
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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

CRD summary
This study examined the cost-effectiveness of various intervals of lipid screening compared with no screening in adult patients with Hodgkin's lymphoma, who had received mediastinal irradiation five years earlier. The authors concluded that lipid screening, with statin therapy for patients who tested positive, was a cost-effective alternative to no screening and an interval of three years was the preferred strategy. The methods appear to have been valid and the study was generally well presented. The authors' conclusions are valid.

Type of economic evaluation
Cost-utility analysis

Study objective
This study examined the cost-effectiveness of various intervals between lipid screening, compared with no screening, in adult patients with Hodgkin's lymphoma, who had received mediastinal irradiation and were still alive after five years.

Interventions
The interventions were no screening and screening every year, three years, five years, or seven years. Screening was discontinued when patients were over 65 years old. Patients found to have hyperlipidaemia were given statin treatment.

Location/setting
USA/primary and secondary care.

Methods
Analytical approach:
The analysis was based on a Markov model, with a lifetime horizon. The authors stated that a modified societal perspective was considered.

Effectiveness data:
The clinical data were from a selection of relevant studies, national databases, surveys, and other published reports, which were only partially described. For example, the relative risk of cardiac events, which was the key clinical endpoint, was from the Framingham Heart Study. Mortality and other epidemiological data were from US life tables and US databases. Some assumptions were also made.

Monetary benefit and utility valuations:
The utility values were derived using time trade-off scores from the Beaver Dam Health Outcomes Study.

Measure of benefit:
Quality-adjusted life expectancy (QALE) was the summary benefit measure and this was discounted at an annual rate of 3%. Life expectancy data were also reported.

Cost data:
The analysis included the costs of screening (by lipid panel), treatment (atorvastatin therapy, liver function tests, and office visits), and non-fatal and fatal cardiac events. The costs and quantities of resources were derived from Medicare reimbursement schedules, the Red Book pharmacy reference, and medical literature. All costs were in US dollars ($).
and were discounted at an annual rate of 3%. The price year was 2006 and costs, from other years, were converted using the medical care component of the Consumer Price Index.

**Analysis of uncertainty:**
Deterministic sensitivity analyses were carried out to assess the stability of the base-case findings to variations in the key model inputs. The inputs were varied using published ranges or 50% to 200% of their baseline values.

**Results**

In men, the QALE was 235.15 months with no screening, 236.74 months with seven-yearly screening, 236.81 months with five-yearly screening, 236.84 months with three-yearly screening, and 236.89 months with annual screening. The costs were $11,100 with no screening, and $14,100 with seven-yearly, $14,300 with five-yearly, $14,500 with three-yearly, and $14,800 with annual screening. Compared with the next less frequent screening, the incremental cost per quality-adjusted life-year (QALY) gained was $22,700 with seven-yearly, $31,700 with five-yearly, $78,200 with three-yearly screening, and $125,500 with annual screening.

In women, the QALE was 292.03 months with no screening, and 294.20 months with seven-yearly, 294.26 months with five-yearly, 294.30 months with three-yearly, and 294.34 months with annual screening. The costs were $5,500 with no screening, and $10,400 with seven-yearly, $10,600 with five-yearly, $10,900 with three-yearly, and $11,600 with annual screening. Compared with the next less frequent screening, the incremental cost per QALY gained was $27,000 with seven-yearly, $42,800 with five-yearly, $97,900 with three-yearly screening, and $165,400 with annual screening.

All screening strategies were cost-effective compared with no screening, at a threshold of $100,000 per QALY. The incremental cost-utility ratios were generally higher (less favourable) for women than for men, but at the threshold of $100,000 per QALY, three-yearly screening was the most economically attractive strategy, for both women and men.

The most influential model inputs were the risk of cardiac events or death after Hodgkin’s lymphoma treatment, the efficacy and costs of statins, and the discount rate. Changes in these parameters changed the order of preference for the screening intervals.

**Authors' conclusions**
The authors concluded that lipid screening, with statin therapy for patients who tested positive, was a cost-effective alternative to no screening and the screening interval of three years was the preferred strategy.

**CRD commentary**

**Interventions:**
The rationale for the selection of the comparators was clear as screening was appropriately compared with no screening, which was likely to be the standard care in some settings. The selection of the screening intervals appears to have been valid and they reflected the potential strategies for these patients.

**Effectiveness/benefits:**
The derivation of the clinical inputs was not fully described. Some sources were reported, but the approach used to identify them was not. The use of US databases for the epidemiological data was appropriate and the risk of cardiac events was from a well-known published study (the Framingham Heart Study), but further description of these sources would have been useful to fully judge the validity of the clinical data. QALE was used as the main benefit measure and this allows comparisons of these results with those of other published economic evaluations and it accounts for both mortality and quality of life. The utility values were from a published study and were obtained using a validated instrument.

**Costs:**
The categories of costs were consistent with the viewpoint of the analysis, but most of them were presented as total categories, as is necessary when Medicare data are used. Some costs were varied in the sensitivity analysis, especially those of the medications. The price year and the discount rate were reported.

**Analysis and results:**
The results of the analysis were clearly presented and the total costs, benefits and incremental cost-effectiveness ratios were reported. The issue of uncertainty in the model parameters was only partly addressed by the univariate sensitivity analysis. A multivariate analysis would have more fully assessed this uncertainty. A description of the decision model was given and an appropriate horizon was chosen to capture all the relevant outcomes. The authors stated that one of the main limitations of their analysis was the need for assumptions. For example, it was assumed that survivors of Hodgkin's lymphoma developed hyperlipidaemia at a similar rate as in the general population, they responded similarly to statins, and they had a similar risk of death after cardiac events.

Concluding remarks:
The methods appear to have been valid and the study was generally well presented. The authors' conclusions are valid.

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