Cost-effectiveness of screening for unhealthy alcohol use with % carbohydrate deficient transferrin: results from a literature-based decision analytic computer model

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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 evaluated the cost-effectiveness of the percentage of carbohydrate-deficient transferrin (%CDT) test for screening for unhealthy alcohol use in men and women aged 18 to 100 years, in primary care. The authors concluded that adding the %CDT test to the questionnaire-based screening was cost-effective. The methods were good and the reporting and discussion were satisfactory. The authors’ conclusions appear to be valid.

Type of economic evaluation
Cost-effectiveness analysis, cost-utility analysis

Study objective
To evaluate the cost-effectiveness of using the percentage of carbohydrate-deficient transferrin (%CDT) test to screen, in primary care, for unhealthy alcohol use, in men and women, aged 18 to 100 years.

Interventions
Four screening strategies were examined. These were the Alcohol Use Disorders Identification Test (AUDIT) questionnaire only, %CDT test only; AUDIT followed by %CDT test, and no screening (case finding).

Location/setting
USA/primary care.

Methods
Analytical approach:
The analysis was based on a decision-analytic model, for the short-term (screening, assessment, and treatment), followed by a Markov model, with six alcohol-related health states, for a lifetime horizon. The authors stated that they adapted a societal perspective.

Effectiveness data:
The effectiveness data were derived from published studies identified through MEDLINE search, expert opinion, and relevant documents. Only bibliographical details were given for the sources of effectiveness data. The key clinical endpoints were the transitions between alcohol-related states (non-drinker, safe drinker, at-risk drinker, alcohol abuser, alcohol dependent, and alcohol dependent in recovery), with each scenario and age. The transition rate from the non-drinker state and the transition rate into the dependent state were estimated by adjusting the other transition rates until the proportions entering those states were consistent with published data.

Monetary benefit and utility valuations:
The utility values for alcohol-related health states were derived from a published study, which used the standard gamble method to elicit the preferences. The utility values for non-drinkers and safe drinkers were based on published estimates.

Measure of benefit:
Quality-adjusted life-years (QALYs) and life-years gained were the summary measures of benefit. Future QALYs and life-years were discounted at an annual rate of 3%.
Cost data:
The cost categories were physician time, %CDT laboratory testing, venipuncture, travel paid by patients, and hourly wages lost for patients. The sources of resource use were published evidence and authors' assumptions. The sources of cost data were Medicare reimbursement, the Medical Expenditure Panel Survey, and the Bureau of Labor Statistics. All costs were expressed in US dollars ($). The price year was 2006 and a 3% annual discount rate was applied.

Analysis of uncertainty:
One-way, two-way, and probabilistic sensitivity analyses were performed.

Results
AUDIT alone and AUDIT followed by %CDT test were less costly and more effective than the other two strategies. In the 50-year-old cohort, AUDIT alone cost $143,568, with a gain of 16.013 QALYs. AUDIT plus %CDT test cost $143,581 and resulted in 16.014 QALYs. The incremental cost-effectiveness ratio (ICER) of AUDIT plus %CDT test over AUDIT alone was $15,500 per QALY or $58,600 per life-year.

The baseline ICER was sensitive to many factors, such as AUDIT and %CDT test sensitivity, age at screening, prevalence of unhealthy alcohol use, and the follow-up rate for positive %CDT test results. The probabilistic sensitivity analysis indicated that at the $50,000 per QALY threshold, AUDIT followed by %CDT test was favoured in 64% of simulations compared with AUDIT alone, which was favoured 35% of the time.

Authors' conclusions
The authors concluded that adding the %CDT test to the questionnaire-based screening for unhealthy alcohol use was cost-effective.

CRD commentary
Interventions:
The rationale for the selection of the comparator (the AUDIT questionnaire) was clear as it was the recommended care in the authors’ setting.

Effectiveness/benefits:
The search strategy, used to identify evidence in MEDLINE, and the inclusion criteria were not reported, but the authors stated that the best available evidence was used. All the sources for the clinical evidence were reported, with some description of their designs. This limited information does not allow a judgement of the internal validity of the estimates, but the extensive sensitivity analysis assessed the effects of alternative estimates on the results. The measures of benefit were appropriate, but the sources used to derive the utility values were not described.

Costs:
The methods used to calculate the costs were described and the sources of cost data were reported and reflected the authors’ setting. For most items, the unit costs and resource quantities were not reported separately. This limits the possibility of replicating the results in other settings. Discounting was appropriately conducted. The price year was reported, which will aid reflation exercises. The key cost assumptions were investigated in the sensitivity analysis.

Analysis and results:
A diagram of the model, the results, and the analysis were fully and clearly presented. The costs and benefits were synthesised in an incremental analysis, which appropriately ruled out the dominated (more costly and less effective) strategies and ranked the remaining ones. The issue of uncertainty was investigated in both deterministic and probabilistic analyses, which increases the reliability of the analysis, but the details of the probabilistic approach (the types of distributions and other assumptions) were not reported. The authors acknowledged that there were some limitations to their analysis, such as the lack of an estimate for the prevalence of alcohol use in primary care.

Concluding remarks:
The methods were good and the reporting and discussion were satisfactory. The authors’ conclusions appear to be valid.
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