A cost-effectiveness analysis of screening urine dipsticks in well-child care

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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 screening by dipstick urine analysis, compared with no screening, for chronic kidney disease in asymptomatic schoolchildren. The authors concluded that the urine dipstick was inexpensive, but its poor diagnostic yield resulted in an unfavourable cost-effectiveness result. These findings supported the American Academy of Pediatrics guidelines at the time. There were some methodological limitations and limited reporting of the sources of the clinical data, which both reduce the validity and reliability of the authors’ conclusions.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
This study examined the cost-effectiveness of screening by dipstick urinalysis, compared with no screening, for chronic kidney disease in asymptomatic school-aged children.

Interventions
The two strategies were dipstick urinalysis, diagnostic analysis of a urine sample, and no screening.

Location/setting
USA/primary care.

Methods
Analytical approach:
The analysis was based on a decision-tree model, with a short time horizon. The authors stated that the perspective was that of the primary care practitioner.

Effectiveness data:
The clinical data were from the published reports of a large retrospective cohort study of 8,954 asymptomatic schoolchildren aged eight to 15 years, whose urine was analysed. The incidence of chronic kidney disease was the primary endpoint of this study.

Monetary benefit and utility valuations:
Not considered.

Measure of benefit:
The number of diagnoses of chronic kidney disease was the benefit measure.

Cost data:
The economic analysis considered the cost of dipstick urinalysis, which included supplies (specimen container, nitrile gloves, wipes, benzoin tincture, and urine dipstick) and labour (nurse salary and fringe benefits). The unit costs and resource quantities were reported. The costs for no screening were assumed to be nil. The costs were from the authors’ institution and were in US dollars ($).

Analysis of uncertainty:
Not considered.
Results
The no screening strategy had no cost and detected no cases of chronic kidney disease. With screening, there was one case of chronic kidney disease detected per 800 children, at a cost of $3.47 per patient. Retesting was required for 14.2% of children, due to abnormal results in the first test. The incremental cost per case of chronic kidney disease diagnosed was $2,779.50.

Authors' conclusions
The authors concluded that urine dipstick analysis was inexpensive, but its poor diagnostic yield resulted in an unfavourable cost-effectiveness result. These findings supported the American Academy of Pediatrics guidelines at the time.

CRD commentary
Interventions:
The rationale for the selection of the comparators was clear as the screening strategy was compared against no screening, which was the recommended strategy in the authors' setting.

Effectiveness/benefits:
Insufficient details were given of the methods and other characteristics of the published source of evidence for the incidence of chronic kidney disease, to judge the validity of this clinical data. It was reported that a relatively large sample of children participated in the study, but few other details were provided. The children in this study were not American, it was conducted in the late 1970s, and several children were lost to follow-up. These points might limit the analysis. The benefit measure was disease specific and does not allow comparisons with the benefits of other health care interventions.

Costs:
The categories of costs were consistent with the economic viewpoint. A list of cost items was presented and the unit costs and resource quantities were given. The sources were appropriately reported. The authors did not investigate alternative cost estimates, except a mention that the Medicare reimbursement cost was comparable to their estimate, and all the economic inputs were treated deterministically. The price year was not stated, but the Medicare data were from 2008. No cost was assumed for no screening, but the costs of the treatment of undiagnosed cases might have been important from a broader perspective, such as that of the hospital.

Analysis and results:
The results were clearly reported. The costs and benefits were appropriately synthesised in an incremental analysis. The uncertainty was not investigated, which limits the external validity of the analysis. The cost-effectiveness of the dipstick urinalysis for chronic kidney disease in children should be evaluated using a broader perspective to take account of the costs and quality of life associated with chronic kidney disease and its treatment. A longer time horizon should be considered to fully assess the effects of screening.

Concluding remarks:
There were some methodological limitations and limited reporting of the sources of the clinical data, which both reduce the validity and reliability of the authors' conclusions.

Funding
Not stated.

Bibliographic details

PubMedID
20231188

DOI