Use of Capsule Endoscopy in Diagnosing Obscure Gastrointestinal Bleeding: Cost–Effectiveness Evaluation from a European Perspective

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OBJECTIVES

To analyze the cost-effectiveness of capsule endoscopy (CE) in diagnosing obscure gastrointestinal bleeding (OGIB) from a health care payer perspective in France, the United Kingdom and Switzerland.

METHODS

Clinical Data:
- 7 controlled clinical trials following the same study protocol
- n = 184 patients with OGIB and previous negative gastroscopy and negative colonoscopy
- Comparator: push enteroscopy (PE)
- Effectiveness parameters: sensitivity and specificity ranges, correctly diagnosed patients

Cost Data:
- Procedure cost of CE and PE
- Cost of diagnostic failure:
  - due to false positive diagnosis (FP)
  - due to false negative diagnosis (FN)
- For FP cost an assumption of unnecessary treatment was made
- For FN cost diagnostic procedures performed two years prior to study start were considered and allocated according prevalences in the model

Modeling:
- Micro-simulation model incorporating first-and second-order Monte Carlo simulation
- Simulation of 10,000 patients
- Prevalence rates from 10% to 90%
- Break down of FN cost into 9 cycles, allocation according prevalence
- Cost-effectiveness parameter: costs per correctly diagnosed case in patients with obscure gastrointestinal bleeding.
- Incremental cost-effectiveness (ICE) and isocontour graphs

RESULTS

- Incremental Cost-Effectiveness (ICE) of PE vs. CE varies depending on the disease prevalence in the patient populations (Fig. 1).
- Cost per additional correctly diagnosed patient less than with PE, i.e. cost saving for health care payer, in all countries if the prevalence exceeds 10%.
- Greatest savings observed for the CH. Isocontour graphs - results of probabilistic sensitivity analyses - demonstrate high consistency within 10,000 analyses (Figure 2).

CONCLUSIONS

CE is cost saving - the dominant strategy - in all three countries, i.e. more effective and less costly compared to push enteroscopy if the prevalence of the disease is 10% or higher. Most common use of CE is at a prevalence of 50%.

Cost savings per patient at a prevalence of 50% are for example 1695 € for UK, 1508 € for France and 2240 € for Switzerland. Probabilistic sensitivity analyses prove a high robustness of the results.