BACKGROUND

Radium-223 Dichloride (Radium-223)

• This first-in-class alpha-emitting radiopharmaceutical selectively targets bone metastases.

• Radium-223 is approved by Health Canada and worldwide for the treatment of castration-resistant prostate cancer (CRPC) patients with symptomatic bone metastases and no known visceral metabolic disease.

• In the ALSYMPCA phase 3 trial, radium-223 was best standard of care (BSoC) versus placebo + BSoC:
  - Significantly improved overall survival (HR = 0.92; P = 0.03);
  - Significantly prolonged time to first symptomatic skeletal event (SSE) (HR = 0.66; P < 0.001).

• A post hoc analysis demonstrated that radium-223 was associated with a reduction in overall medical resource use (MRU) in ALSYMPCA:
  - Hospitalization days were reduced with radium-223 + BSoC versus placebo + BSoC (8.1 vs 14.6; P = 0.001).

METHODS

• A Markov model was developed with 5 health states reflecting disease progression and SSE (Figure 1).

• The Canadian payer perspective was used.

• Time in each health state was based on extrapolated results from ALSYMPCA, incorporating overall survival, time to SSE, and time to skeletal prophylaxis (AP+)-defined disease progression.

• Disease progression was defined as an increase of ≥25% from baseline total ALP at ≥12 weeks in patients with no decrease from baseline or an increase of ≥25% above the nadir confirmed ≥3 weeks later in patients with initial decrease from baseline.

• SSE was defined as the first use of a bone cancer radiation therapy to reduce skeletal symptoms, new symptomatic pathologic bone fracture, spinal cord compression, or tumor-related death.

OBJECTIVES

• To evaluate the estimated cost-effectiveness of radium-223 + BSoC versus placebo + BSoC in Canada.

• To present results from an existing cost-effectiveness analysis model that was modified by incorporating property MRU data from ALSYMPCA.

RESULTS

Cost-Effectiveness Base Case Results

• Incorporating MRU data (Table 4):
  - Reduced the incremental cost by $11,605 relative to that without MRU data.
  - Increased the incremental cost-effectiveness ratio for radium-223 + BSoC versus placebo + BSoC by $655 to $73,629 per quality-adjusted life year (QALY).

• This is substantially less than the $150,000 per QALY threshold used in the Canada-estimated model.

• Sensitivity Analyses
  - Sensitivity analyses demonstrated robustness of cost-effectiveness results.

CONCLUSIONS

• This study confirms the cost-effectiveness of radium-223 as a treatment for patients with CRPC and symptomatic bone metastases and no visceral metastes.

• Including directly observed MRU data in this model markedly improved the impact of radium-223 versus modeled benefits alone regardless of prior docetaxel use.

• Reduced hospital utilization with radium-223 may be driven by delays in time to docetaxel use.

• The model results are consistent with previous results from the Canada-estimated model.

• At a willingness-to-pay threshold of $100,000, there is a 70% probability of radium-223 + BSoC versus placebo + BSoC in the overall population.

RESOURCES

• The authors thank with Stelldigm Communications for editorial and creative assistance in the preparation of this paper.

REFERENCES


