Abstracts

A MARKOV MODEL EVALUATING THE COST-UTILITY OF A 4D REAL-TIME ELECTROMAGNETIC TRACKING SYSTEM (CALYPSO® 4D LOCALIZATION SYSTEM WITH BEACON TRANSPONDERS) IN THE LOCALIZATION OF PROSTATE TUMORS DURING RADIOTHERAPY

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OBJECTIVES: Since accurate tumor localization during radiotherapy is critical to maximizing therapeutic efficacy while minimizing toxicity, the cost-effectiveness of localization technologies should be investigated. We performed a cost-utility analysis evaluating the relative advantage of using a real-time 4D electromagnetic tracking system, the Calypso® 4D Localization System with Beacon® Transponders (“Calypso® 4D Localization System;” Calypso Medical, Seattle, Washington) during prostate radiotherapy. METHODS: Using decision analysis and Markov processes, the outcomes of patients localized during prostate radiotherapy were simulated over five years and measured as direct costs from a payer’s perspective and quality-adjusted life years (QALYs). The clinical pathway for patients undergoing external beam radiation was modeled via health states: 1) Time in Treatment, 2) Relapse-Free with Localization, 3) Relapse-Free without Localization, and 4) Deceased. Using evidence from a prospective clinical trial of the Calypso® 4D Localization System and published literature, transition states were modeled for achievement of biochemical no evidence of disease (bNED) control and biochemical relapse-free survival (BRFS). Costs and disutilities of radiation-induced toxicities were included. Post-hoc sensitivity analyses were performed. RESULTS: Over five years, patients localized with real-time 4D electromagnetic tracking gained 2.47 QALYs at $5432/QALY. Compared to ultrasound, electronic portal imaging devices, or computed tomography, the real-time 4D electromagnetic tracking system yielded superior QALY gains at comparable costs. Compared to ultrasound, this technology generated 43 additional quality-adjusted life days and an incremental cost-effectiveness ratio of $14,053/QALY. Overall, the model was sensitive to changes in bNED control rates and BRFS. CONCLUSION: The real-time 4D electromagnetic tracking system is cost-effective for target localization during prostate radiotherapy. However, the current model’s sensitivity to variances in long-term outcomes warrants collection of rigorous evidence on long-term quality of life and tumor control in patients using localization technologies. Future studies might incorporate patient registry data, patient-reported outcomes, and follow-up data from prospective clinical trials.

A COST—UTILITY ANALYSIS MODEL FOR THE SECOND LINE TREATMENT OF METASTATIC RENAL CELL CARCINOMA IN MEXICO

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OBJECTIVES: Renal cancer represents 1.5% of all tumors observed in Mexico and they are responsible of high expenditures in the Mexican Health System. The purpose of the study was to model the economic and health consequences of second-line treatments (previous failure of cytokine therapies) in adult patients with metastatic renal cell carcinoma (mRCC) in stages III and IV from the health care payer’s perspective. METHODS: A cost—utility analysis was developed using a Markov modeling approach. The model simulates costs and quality adjusted life years (QALYs) gained in a ten-year period among four possible health states (no new progression, death due to mRCC, history of new progression and death due to other causes). The model aimed to compare sunitinib 50 mg/day vs. local best supportive care (BSC) as second-line treatments. Transition probabilities and QALYs of the Markov model were obtained according to clinical trials previously published in the literature. Resource use and costs data was obtained from hospital records at Hospital de Oncología CMN “Siglo XXI” in Mexico City (n = 80). Both costs and QALYs were discounted using a 5% annual rate. Probabilistic sensitivity analysis was performed and tornado diagrams were constructed (±25% on relevant model variables). RESULTS: Second line treatment with sunitinib showed the highest QALYs gained per patient (1.32 QALYs) vs. BSC treatment (0.39 QALYs). Nevertheless, expected health care costs for sunitinib resulted in US$36,928 and BSC therapies in US$4103. The incremental cost per QALY gained resulted in US$35,238. Results were robust to Monte Carlo first order sen-
Abstracts

Poster Session 1 – ART (10:00 AM – NOON)

PCN31
SYSTEMATIC REVIEW OF TREATMENTS/INTERVENTIONS AND QALY IN BREAST CANCER PATIENTS
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OBJECTIVES: Breast cancer is the most common cancer among women. Several treatments are available, but there is no comprehensive overview which covers both treatments and QALYs. The objective of this study was to conduct a systematic review of the treatments and QALYs for breast cancer patients.

METHODS: Electronic, manual, and bibliographic searches of OVID, EMBase, and PubMed were conducted expanding from 1990 to 12/21/06. Randomized clinical trials evaluating different interventions on breast cancer in QALY were included. Breast cancer and QALY were used as the key words. Among 169 articles, 15 articles are included for this full-text review. RESULTS: Hormone therapy, chemotherapy and prophylactic surgery were three major methods of treating breast cancer. Among these articles, 56% of them mentioned letrozole and tamoxifen or their combination therapy, which were targeted for postmenopausal women with early stage breast cancer. More QALYs were gained within the range from 0.1 to 0.36 in 5 years’for (i) tamoxifen followed by letrozole compared with tamoxifen only or (ii) letrozole as the first line therapy followed by tamoxifen therapy compared with letrozole as the second-line therapy. Moreover, anastrozole and exemestane also increased QALYs in postmenopausal with ER+ breast cancer patients. Capcitabine/docetaxel and CMF could increase quality-adjusted survival and relapse-free survival 1.8 and 1.5 years compared with no treatment. Routine postoperative radiotherapy after sector resection and ancillary dissection or conservative surgery for early-stage breast cancer women would also gain QALYs compared with no postoperative radiotherapy. CONCLUSION: Very few studies have been found using QALY to evaluate different interventions to treat breast cancer patients in the different stages. Patients should adopt treatments based on their own age and the stage of breast cancer. Further research on breast cancer interventions is needed to understand the cost-effectiveness of alternative or combining treatments in order to establish standard treatments for breast cancer.

PCN32
COST UTILITY ANALYSIS OF DOCETAXEL VERSUS OTHER REGIMENS IN THE NEOADJUVANT THERAPY OF LOCALLY ADVANCED BREAST CANCER IN POLAND
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OBJECTIVES: To compare cost utility of docetaxel chemotherapy with other neoadjuvant treatment regimens in locally advanced breast cancer. METHODS: Cost-utility Markov model from payer perspective (health insurance and patient), using costs information from published sources and the patient lifetime horizon. RESULTS: Four comparisons, CVAP + T (cyclophosphamide/vincristine/doxorubicin—100/1,5/50/40 mg/m2, 4 cycles + docetaxel/prednisolone—100/100 mg/m2, 4 cycles) vs CVAP ((cyclophosphamide/vincristine/doxorubicin/prednisolone—1000/1,5/50/40 mg/m2, 4 cycles + 1000/1,5/50/100 mg/m2, 4 cycles), AC + T (doxorubicin/cyclophosphamide—60/600 mg/m2, 4 cycles + docetaxel 100 mg/m2, 4 cycles) vs AC (doxorubicin/cyclophosphamide—60/600 mg/m2, 4 cycles), AT (doxorubicin/docetaxel—50/75 mg/m2, 4 cycles) vs FAC (fluorouracil/doxorubicin/cyclophosphamide—500/50/500 mg/m2, 4 cycles), AT (doxorubicin/docetaxel—50/75 mg/m2, 6 cycles) vs AC (doxorubicin/cyclophosphamide—60/600 mg/m2, 6 cycles) were performed. One randomized clinical trial was included for each comparison. Average costs of the treatment of locally advanced breast cancer (including neoadjuvant chemotherapy, surgery, additional radiotherapy, treatment of adverse events) and treatment effects were per patient: CVAP + T 40280 PLN/20,507 QALY vs CVAP 11879 PLN/12,576 QALY; AC + T 39924 PLN/20,483 QALY vs AC 8886 PLN/12,636 QALY; AT 32056 PLN/20,483 QALY vs FAC 8480 PLN/12,636 QALY; AT 40186 PLN/20,171 QALY vs AC 6999 PLN/12,452 QALY. ICUR for CVAP + T vs CVAP comparison was 3580 PLN/QALY. ICUR for AC + T vs AC was 3955 PLN/QALY and ICER 3402 PLN/LYG. ICUR for AT vs FAC was 3004 PLN/QALY and ICER 2583 PLN/LYG. ICUR for AT vs AC was 4300 PLN/QALY and ICER 3637 PLN/LYG. CONCLUSION: Docetaxel regimens are more effective and more expensive in the neoadjuvant treatment of patients with locally advanced breast cancer compared with CVAP, AC and FAC chemotherapies, ICUR range 3004-4300 PLN/QALY.

PCN33
ANALYSIS OF DRUG REQUIREMENT FOR TREATMENT ADVANCED HODGKIN’S DISEASE
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OBJECTIVES: To determine drug requirement for treatment advanced Hodgkin’s disease. METHODS: Drug requirement was calculated on the basis of data about recommended treatment schemes of Hodgkin’s disease (HD), amount of treatment courses for one case of HD and average body surface area of patients with HD. Average body surface area calculated on the basis of medical documentation of 192 HD patients were treated in HSC RAMS. Drug requirement in specified region or public health institution was calculated based on frequency of advanced HD in these region or institution (in our case—HSC RAMS). RESULTS: HD treatment schemes BEACOPP-14 is pharmacoeconomic dominate alternative (Tolkushin A.G. et al. 2006). Average body surface area amount to 1.77 ± 0.037 m2. Amount of treatment courses for one case of HD were 6. Average drug requirement were 6.90 g or 69 vials in 100 mg of Cyclophosphamide, 3.98 g or 8 vials in 500 mg of Dacarbazine, 266 mg or 5 vials in 50 mg of Doxorubicin, 3.19 g or 32 tablets in 100 mg of Etoposide, 106 mg or 7 vials in 15 mg of Bleomycin, 15 mg or 15 vials in 1 mg of Vincristine and 5.95 g or 1.2 thousand tablets in 5 mg of Prednisolone. Average number of advanced HD patients in HIT department of HSC RAMS were 20 patients per year. Average annual drug requirement in HIT department of HSC RAMS were 138, 159, 106, 637, 142, 297 vials and 23.7 thousand tablets of Cyclophosphamide, Dacarbazine, Doxorubicin, Etoposide, Bleomycin, Vincristine and Prednisolone, respectively. CONCLUSION: The drug requirement for one case of advanced Hodgkin’s disease and average annual drug requirement in HSC RAMS were determined. If one know average number of Hodgkin’s disease patients it is possible to determine amount of drug.