PCN53

RISK OF PERSONAL BANKRUPTCY FOLLOWING A CANCER DIAGOSIS

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OBJECTIVES: Bankruptcy may be a particular concern for cancer patients. Costs from treatment and supportive care, along with non-medical costs such as lost income, can be financially devastating. We estimated the incidence of bankruptcy following cancer diagnosis using linked cases from the Washington SEER registry with Western District of Washington bankruptcy court records. **METHODS:** Cancer cases (age >20) were identified for 1995-2009. Our analyses were limited to patients reporting their first primary cancer, excluding cancers *in situ* or diagnosed at time of death. To determine the proportion of cancer cases reporting personal bankruptcy (Chapter 7 or 13) following cancer diagnosis, we generated cumulative incidence (CI) of bankruptcy, to allow for the competing risk of death. We calculated CI using Gray's method to compare bankruptcies among different cancers. **RESULTS:** There were N=231,799 cancer cases; after a mean follow-up of 4.3(sd=4.1) years, N=4805 (2.1%) had filed for bankruptcy after cancer diagnosis. Average age at diagnosis of filers was 52.8(sd=13.6) years and 55% were female compared to 63.9(sd=14.6) years and 49% female for all cancer cases ($p<0.0001$ for both comparisons). Mean and median time to bankruptcy was 3.3 and 2.5 years, respectively. At 1, 2 and 3 years following diagnosis, the proportion of bankruptcies filed was 23%, 41%, and 56%, respectively. By 3 years, the incidence of bankruptcy was 1.3%. Thyroid cancer had the highest CI at 3 years (2.7%), followed by uterine (1.7%), melanoma (1.6%), breast (1.6%), leukemia/lymphoma (1.4%), colorectal (1.2%), lung (1%) and prostate (0.9%); the CI for all other cancers was 1.3%. The overall CI of bankruptcy was 3.3%. **CONCLUSIONS:** Two in 100 patients file for bankruptcy following a cancer diagnosis. Thyroid and uterine cancer have the highest incidence of bankruptcy. Factors associated with bankruptcy following cancer are yet to be determined.

PCN54

INJECTION OF LONG-ACTING SOMATOSTATIN ANALOGS: A COST CONSEQUENCE ANALYSIS IN FRANCE, GERMANY, THE UNITED KINGDOM AND THE UNITED STATES

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OBJECTIVES: Patients treated for neuroendocrine tumors and acromegaly have to be periodically injected with a long-acting somatostatin analog (SSA). This study aimed at evaluating the economic implications of using a new pre-filled device for Somatuline Autogel/Depot versus Sandostatin LAR. The study was performed in three European countries and the US. **METHODS:** A quantitative study was performed in France, Germany, the UK and the US, including 77 nurses. The majority of nurses were from hospital wards, specialized in endocrinology and oncology. The number of SSA patients per nurse was at least 3 per year. Time spent for each injection and number of clogging episodes was recorded per nurse and per type of injection (Somatuline new device or LAR). Cost of successful injection was calculated per patient / per nurse using retail costs for the 4 countries. **RESULTS:** With LAR, 2 clogging incidents were reported. This led to an average of 79 injections for LAR vs. 77 for Somatuline new device. The calculated cost per successful injection for the 4 countries pooled together was in Euro: 1'603 and 1'628 respectively for Somatuline new device and LAR. The incremental cost between the 2 treatments was EUR 25 per injection. Assuming an 85% compliance, this translated up to EUR 255 per patient per year. When considering only the 3 European countries, the annual difference was EUR 724. **CONCLUSIONS:** The usage of a new pre-filled Somatuline device for the injection of SSA could lead to substantial savings for hospitals and health-care payers. Due to the differences in retail prices across countries, these savings could potentially be even more significant in Europe.

PCN55

RACIAL VARIATION IN THE COST-EFFECTIVENESS OF CHEMOTHERAPY FOR PROSTATE CANCER

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OBJECTIVES: Heterogeneity of treatment effects and variation in expenditures across subgroups impact the cost-effectiveness of health care interventions. This study investigates the variation in costs, effects, and incremental cost-effectiveness ratios (ICERs) associated with chemotherapy receipt in elderly metastatic (M1) prostate cancer (PC) patients across race/ethnicity subgroups (Non-Hispanic Whites, Non-Hispanic Blacks, Others). **METHODS:** We examined patients aged 66 or older identified using linked Surveillance, Epidemiology and End Results (SEER)-Medicare data, who were diagnosed with M1 PC between 2000 and 2005. Cost data based on Medicare reimbursements were available for 36 months after diagnosis. Mean costs and effects (life-years gained, LYG) were adjusted for censoring using inverse probability weighting. The baseline scenario examined PC-specific medical costs up to 24 months and required patients to be alive for at least 3 months after diagnosis. Sensitivity analysis considered sampling uncertainty, selection into treatment, and adjustments to initial model assumptions. **RESULTS:** We identified 3,888 M1 PC patients, of which 24% (N=930) received chemotherapy (mostly docetaxel and mitoxantrone). Twenty percent of observations were censored. The full sample ICER was $99,146 per LYG (95% CI: $75,041-$130,194). Compared to Whites ($107,095; CI: $78,391-$148,272), ICER point estimates were lower for Blacks ($59,887; CI: $22,860-$121,509) and higher for Others ($123,909; CI: $37,782-$366,376). We also observed substantial variation across racial subgroups in the probability of chemotherapy being cost-effective given various willingness-to-pay thresholds per LYG. Results were similar in sensitivity analysis. **CONCLUSIONS:** Chemotherapy use in elderly M1 PC patients is associated with an ICER of $99,146 per LYG in our sample. Subgroup analysis revealed racial heterogeneity in ICER point estimates and considerable statistical uncertainty. In order to generate a reliable evidence base for personalized medicine, efforts to increase the representation of minorities in clinical trials, registries, and other health care datasets need to continue.

PCN56

COST-EFFECTIVENESS OF TEMSIROLIMUS FOR METASTIC RENAL-CELL CARCINOMA AND POOR PROGNOSIS PATIENTS IN MEXICO

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OBJECTIVES: Renal cell carcinoma (RCC) is the most common primary renal malignant neoplasm in adults. It accounts for approximately 90% of renal tumors and 2% of all adult malignancies. The purpose of this study was to estimate the cost-effectiveness of temsirolimus versus interferon-α for patients treated as first line with metastatic renal-cell carcinoma and poor prognosis from an institutional perspective. **METHODS:** A three-state Markov model was performed to estimate health and economic consequences during a time horizon of 12 months (six–week cycles). Effectiveness measures were: overall survival, progression-free survival (months), and quality adjusted life years gained (QALYs). Drug safety was also assessed (grade 3-4 adverse events-AE). Transition probabilities were obtained from a meta-analysis collecting international published literature data. Doses of comparators were: temsirolimus (25mg/week) and interferon-α (41,380,000 IU/week). Resource use was obtained from Social Security Mexican Institute hospital records (n=154). Costs were extracted from institutional sources and include: hospitalization, drugs, medical procedures, laboratory tests and adverse events management. Probabilistic sensitivity analyses were performed and acceptability curves were constructed. **RESULTS:** Temsilorimus overall survival resulted in 10.9 months (CI 95% 10.63 – 11.17) and interferon-α achieved 7.3 months (7.09 – 7.51) ($p<0.05$). For progression-free survival, temsirolimus estimation was 5.5 months (5.36 – 5.64) and interferon-α exhibited 3.1 months (3.01 – 3.19) ($p<0.05$). Lastly, temsirolimus raised QALYs in 0.74 (0.72 – 0.76), ($p<0.05$), and diminished grade 3-4 hematologic AE in −9.59% (−9.35% - −9.83%), ($p<0.05$). Incremental cost-effectiveness ratio (ICER) for overall survival and progression-free survival for temsirolimus against interferon-α were US$4,839 [US$4,718-US$4,961] and US$7,259 [US$7,077-US$7,441], respectively. The ICER using QALYs resulted in US$23,458 [US$22,869-US$24,046]. Probabilistic sensitivity analyses showed that results were robust. **CONCLUSIONS:** Regarding overall survival, progression–free survival and QALYs temsirolimus represents a cost-effective therapy in Mexican patients who suffer metastatic renal-cell carcinoma and poor prognosis.

PCN57

ECONOMICS OF A MULTI-GENE ASSAY TO PREDICT RECURRENCE OF EARLY STAGE BREAST CANCER: EXPERIENCE OF A LARGE UNITED STATES INSURANCE PROGRAM

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OBJECTIVES: National guidelines recommend a 21-gene Recurrence Score (RS) to aid in adjuvant treatment decision in estrogen-receptor-positive, node-negative early stage breast cancer (ER+, LN- ESBC) patients. To assess the economic implication of the assay in community practices from the perspective of an US payer. **METHODS:** Analysis of 952 women with ESBC enrolled with Humana, Inc. (Louisville, KY) tested with the 21-gene RS between June, 2006 and June, 2010. The proportion of women classified by the assay by RS risk categories, utilization and costs of chemotherapy regimens, and supportive care, and costs of adverse events were obtained from Humana. We adapted a validated Markov model to compute the cost implications of RS for a representative patient. The probability of risk of recurrence, chemotherapy benefits and decision impact of RS were derived from published studies. **RESULTS:** 255 patients within the tested population received adjuvant chemotherapy. Adjuvant chemotherapy was administered to 10% of women at low risk, 36% of women at intermediate risk, and 72% of women at high risk of recurrence. Based on a meta-analysis in the reduction of chemotherapy after RS, the model estimated an average per patient test saving of $1,115. The immediate direct savings for chemotherapy drug, supportive care, and management of adverse events were $1,897, $2,593, $475, respectively. Prevention of recurrence through appropriate treatment of high-risk patients resulted in additional saving of $126. **CONCLUSIONS:** The adoption of the 21-gene RS lead to targeted management of women with ER+, LN- ESBC, and consequently save direct medical costs.

PCN58

IS CYP2D6 GENETIC TEST IN COMBINATION WITH HORMONE THERAPY FOR ER+ HORMONE SENSITIVE WOMEN WITH EARLY BREAST CANCER COST-EFFECTIVE?

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OBJECTIVES: Approximately 60% of breast cancer cases are a type sensitive to hormones. Tamoxifen is the most widely used treatment of hormone-dependent breast cancer. The pharmacological activity of tamoxifen is dependent on its conversion by the hepatic drug–metabolizing enzyme CYP2D6. Patients with reduced

CYP2D6 activity derive inferior therapeutic benefit from tamoxifen, and may alternatively be treated with newer aromatase inhibitors (AIs). However, the high costs of AIs provide incentive for identifying patients who will benefit from tamoxifen prior to treatment. We estimated the cost-effectiveness of genetic testing in combination with hormone therapy for early breast cancer in Canada. **METHODS:** We performed a cost-effectiveness analysis using a Markov model from a societal perspective and a lifetime horizon. The base case assumed 40-year-old ER+ hormone sensitive women with early breast cancer. We evaluated: genetic testing with subsequent treatment based on genetic status (tamoxifen for CYP2D6 extensive metabolizers and AIs for decreased metabolizers) vs. no testing (tamoxifen for all patients). Probabilistic sensitivity analysis was used to incorporate parameter uncertainties. Expected value of perfect information was performed to identify future research directions. Outcomes were quality-adjusted life years (QALYs) and costs. **RESULTS:** The genetic testing and treatment combination strategy resulted in a 2.87 QALY gain when compared to no testing. The incremental cost was CAD $25,661 compared to standard care, and the incremental cost-effectiveness ratio (ICER) for the base case was $8,927 per QALY. The ICER was sensitive to disease progression among intermediate metabolizers, and costs of terminal care and aromatase inhibitors. **CONCLUSIONS:** CYP2D6 Genetic testing in combination with hormone treatment for early breast cancer patients may be economically attractive in the current setting. Future research is required to determine efficacy of extended tamoxifen (more than 5 years) treatment, the rate of progression to a more advanced cancer health state and adverse events by CYP2D6 polymorphism.

PCN59

COST EFFECTIVENESS ANALYSIS OF LAPATINIB/CAPECITABINE (LC) VERSUS TRASTUZUMAB/CAPECITABINE (TC) IN PATIENTS WITH METASTATIC BREAST CANCER ERBB2+ AFTER PROGRESSION TO THE FIRST SCHEME OF TRASTUZUMAB

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OBJECTIVES: To develop a cost-effectiveness analysis of LC versus TC in the treatment of metastatic breast cancer ErBb2+ after progression to one regime of trastuzumab. **METHODS:** A Markov model was designed with one week length cycles, two years time horizon and two stages: Free of Progression and Progression. The analysis was conducted from the perspective of the Mexican public Health System for patients who had progressed to the first scheme of trastuzumab (around 900 patients). Efficacy data for this specific population was based on and ad-hoc sub analysis reported by Cameron 2010 for LC: 0.50, p=0.001 and per protocol population reported by Minckwitz 2009 for TC: 0.69, p=0.034. Baseline analysis used time to progression for monotherapy reported by Minckwitz and an univariate sensitivity analysis was run with monotherapy results by Cameron. Government prices were used for capecitabine (2000 mg/m2/day), lapatinib (1250 mg/day) and trastuzumab (2 mg/kg/week). One chemotherapy session cost was added every three weeks in the trastuzumab arm. Results are reported in US dollars. **RESULTS:** Cost-effectiveness ratio for LC and TC was $650.82 and $756.86 respectively. LC group had an average incremental effectiveness of 7.47 weeks free of progression and an incremental cost of $371.74 (ICER=$49.74). The acceptability curve showed that with a willingness to pay above $480.16 per free of progression week the 100% of cases would be cost-effective. In the univariate sensitivity analysis the LC group gained 8.04 weeks free of progression with an incremental cost of $225.60 compared to TC (ICER=$28.04). **CONCLUSIONS:** According to this analysis the LC group gained 7.47 weeks free of progression with an extra cost of $371.74 ($49.74 per week) compared to TC. The LC group had a lower monthly cost of treatment ($650.82) than TC ($756.86). LC is cost-effective with a willingness to pay above $480.16 per extra progression free week.

PCN60

COST-EFFECTIVENESS OF PEGFILGRASTIM VERSUS FILGRASTIM AFTER HIGH-DOSE CHEMOTHERAPY AND AUTOLOGOUS STEM CELL TRANSPLANTATION IN PATIENTS WITH LYMPHOMA AND MYELOMA

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OBJECTIVES: To assess the cost-effectiveness of a single-dose Pegfilgrastim 6mg subcutaneously at day 5 *versus* Filgrastim 5μg/kg/day subcutaneously from D5 to resolution of neutropenia (absolute neutrophil count ANC≥0.5G/L) after stem cell reinfusion in adult patients with lymphoma or myeloma, which is one of the first studies on observational data. **METHODS:** Cost-effectiveness was assessed within an open, multicentre randomized phase-II trial. The time horizon was 100+/−10 days from stem cell transplantation. Cost computation, using a microcosting approach focused on inpatient and home care, and cost distributions between the two treatment arms were compared using the Mann-Whitney test. Multiple regression analyses were performed in order to identify cost drivers. Incremental cost-effectiveness ratios (ICERs) were based on the number of days with 1) febrile neutropenia (ANC<0,5G/L and temperature ≥38°C), 2) neutropenia (ANC<1.0G/L), 3) thrombopenia (platelets<20.0G/L), and 4) temperature (≥38°C). Uncertainty around ICERs was evaluated using Filler's method and Monte Carlo simulations. **RESULTS:** 151 patients were enrolled (October 2008/September 2009). One was not evaluable due to missing data. Average total costs reached 25,024€ (SD 9,945€) for Pegfilgrastim (n=74) *versus* 28,700€ (SD 25,165€) for Filgrastim (n=76), with 22,061€ (SD 8,101€) *versus* 25,165€ (SD 16,572€) for hospitalisation; 1,217€ (SD 2,039€) *versus* 1,444€ (SD 3,367€) for anti-infectious treatment; 1,106€ (SD 1,132€) *versus* 1,329€ (SD 2,598) for transfusions; and 639€ (SD 89€) versus 762€ (SD 230€,) for growth factors, respectively. The cost of growth factors significantly decreased with Pegfilgrastim, in women, in patients with previous induction. Pegfilgrastim dominated Filgrastim for number of days with febrile neutropenia, neutropenia, thrombopenia, and temperature. On the two-fold basis of their cost and their medical effectiveness, Pegfilgrastim dominated Filgrastim based on the 82% confidence region. **CONCLUSIONS:** From these results there seems to be no restriction to the prescription of Pegfilgrastim in lymphoma and myeloma patients after high-dose chemotherapy and autologous stem cell transplantation.

PCN61

COST-EFFECTIVENESS OF 1-YEAR ADJUVANT TRASTUZUMAB THERAPY FOR EARLY STAGE OF HER2-POSITIVE BREAST CANCER

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OBJECTIVES: Evaluate the cost-effectiveness of addition one-year adjuvant trastuzumab therapy to standard adjuvant chemotherapy in treatment of HER2 + breast cancer (BC) early stage from a societal perspective in a Russian setting. **METHODS:** We used a Markov state transition model to simulate adjuvant trastuzumab treatment in a hypothetical cohort of early breast cancer patients for lifetime horizon. Patients were treated with a combination of chemotherapy and 1-year trastuzumab therapy (HT + T) or only with chemotherapy (HT). The transition probabilities between states in the Markov model, the effectiveness and usefulness of treatment were obtained from clinical studies HERA, 2005 and other published data. Costs for each state Markov model based on the standard treatment of breast cancer in Russia. Data about cost of medical services and drugs are received from the price-list of out-patient medical aid in clinic MMA of I.M.Sechenov 10.01.2010, site minzdravsoc.ru//medicine and other accessible electronic resources. Costs, effectivenesses, utilities were discounted at 3%. Sensitivity analysis for key parameters in the model was conducted. **RESULTS:** On the basis of Markov model with lifetime horizon, CT+T has an incremental cost-effectivesness ratio (ICER) of 860.704 roubles per LYG and incremental cost-utility ratio (ICUR) of 986.015 roubles per QALY. According to our threshold analysis, additional expenses on additional QALY are in a comprehensible range (825.000 −1.650.000 roubles), that has allowed to make the conclusion about an acceptability of one-year use trastuzumab in treatment of patients HER2 + breast cancer at early stages. Sensitivity analysis showed that major factors influencing cost-effectiveness and cost-utility ratios are survival gain, price of trastuzumab, discount rates. **CONCLUSIONS:** The combination 1-year adjuvant trastuzumab with standard chemotherapy is more cost-effective and cost-useful in comparison with standard chemotherapy for patients HER2 + breast cancer at early stages.

PCN62

BAYESIAN MODELLING ASSESSING THE EFFECTIVENESS OF A VACCINATION STRATEGY TO PREVENT HPV-RELATED DISEASES: THE BEST STUDY

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OBJECTIVES: The cost-effectiveness of different Human Papillomavirus (HPV) vaccination programmes was already confirmed throughout a large body of modelling studies. An excess of uncertainty associated with the main parameters of commonly utilized models can be observed. The aim of this study was to assess the cost-effectiveness of a quadrivalent-based multi-cohort HPV vaccination strategy using a statistical Bayesian approach. **METHODS:** A full Bayesian Markov model was used, where all unknown quantities were associated with suitable probability distributions reflecting the state of science currently available. These distributions were updated by the observation of any Italian available data, and uncertainty was propagated through the entire model with a Markov Chain Monte Carlo procedure. The model was calibrated using age-specific incidence of invasive cervical cancer data. **RESULTS:** Base case (2 cohorts of girls aged 12 and 15 years) and other multi-cohort vaccination strategies under evaluation (3 and 4 cohorts) were cost-effective with a discounted cost per QALY gained corresponding to €12,013 (95% range €2,364 - €22,481), €13,232 (95% range €4,432 - €22,939), and €15,890 (95% range €7,179 - €25,139) for vaccination programmes based on 2, 3 and 4 cohorts, respectively. The overall expected effect of vaccination seems to be linked with the number of cohorts targeted. With a multi-cohort vaccination the combined reduction of HPV-related events occurred progressively early (range 3 – 6.5 years) compared with the vaccination of a single cohort. The analysis of the expected value of information showed that the uncertainty was always kept at a low level among different multi-cohort strategies. The cost associated with the achievement of the expected value of information ranged between €9 and €13 per patient. **CONCLUSIONS:** The quadrivalent-based multi-cohort HPV vaccination programme can provide excellent value for money spent and the Bayesian expected value-of-information analysis provides the most appropriate and feasible representation of this program's true value.