To estimate the cost-effectiveness of different treatments in patients with hepatocellular carcinoma: A retrospective study

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OBJECTIVES: There is a lack of studies for cost-effectiveness analysis on treating hepatocellular carcinoma (HCC). This study aimed at estimating life expectancy (LE), lifetime costs, and incremental cost-effectiveness ratios (ICER) for five different treatments of HCC, using a semiparametric method. METHODS: A retrospective cohort study was performed of a 1,000,000-person random sample obtained from Taiwan's National Health Insurance (NHI) reimbursement database. A total of 1932 newly-diagnosed patients with HCC were indentified and verified with independent file of catastrophic illnesses. These patients were followed from 1997 to 2003 with longitudinal claim data, including all orders and costs of inpatient services, outpatient services, and prescriptions dispensed at pharmacies. They were further stratified to five subgroups with different treatments, comprised of surgery, percutaneous ethanol injection (PEI), transarterial chemembolization (TACE), chemotherapy and radiotherapy, and supportive care. The lifetime survival (up to 50 years) was estimated using the Monte Carlo method as well as borrowing information from the general population. The lifetime costs were estimated by integrating the lifetime survival function and cost function with some assumptions after the follow-up limit. The ICER was also calculated as the net cost of four different treatments study groups divided by the increased number of life years, compared with the supportive care. RESULTS: The LE on overall HCC patient was 35.73 months. The surgery group had the longer LE (85.73 months), and the supportive care group had the shortest LE (15.97 months). The surgery was the most cost-effectiveness treatment, which the ICER was 2138 USD per life year (LY) after lifetime follow-up. The PEI (7124 USD/ELY) was more cost-effective than TACE (10,314 USD/ELY). CONCLUSIONS: The study applied semiparametric methods to project lifetime survival and lifetime costs, using the real cost data from national longitudinal reimbursement database, which might be an alternative method with retrospective approach on cost-effectiveness analysis.

The cost-effectiveness of bortezomib for relapsed/refractory multiple myeloma in Sweden

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OBJECTIVES: To determine the incremental cost-effectiveness of bortezomib (BTZ) compared with lenalidomide plus dexamethasone (LEN+DEX) and dexamethasone (DEX) for the treatment of relapsed/refractory multiple myeloma in Sweden.

METHODS: We constructed a model, using Microsoft® Office Excel 2003 and VBA 6.3 software, to compare the BTZ, LEN+DEX and DEX regimens for relapsed/refractory multiple myeloma. The effects of treatment on time to progression and overall survival (OS) were obtained from published reports of the APEX, MM-009 and MM-010 randomized clinical trials. Costs include drug and administration costs, adverse events, treatment of relapses, and end-of-life costs. Utility estimates are derived from the literature. The analytic framework is based on ‘partitioned survival analysis’ that allows survival data to be decomposed into three states: 1) alive before disease progression; 2) alive after progression, and 3) dead. By computing the amount of time a patient is projected to spend in each state, the model estimates mean OS, quality-adjusted life-years (QALYs), costs and cost per QALY over a 30 year time horizon, and performs both 1-way and probabilistic sensitivity analyses. RESULTS: BTZ mean OS is 38.6 months compared to 24.5 and 37.8 months for DEX and LEN+DEX respectively. Mean lifetime direct medical costs per patient are approximately SEK 562,000, 1,064,000 and 1,641,000 for DEX, BTZ and LEN+DEX respectively. Mean incremental cost per QALY of BTZ compared to DEX is SEK 618,000; 95th percentiles (424,000, 877,000) and is dominant with respect to LEN+DEX. The two most influential variables in our model are (1) utility prior to relapse, and (2) cost of BTZ chemotherapy. CONCLUSIONS: BTZ and LEN+DEX are projected to prolong survival relative to DEX. From a Swedish perspective, BTZ is cost-effective compared to both DEX and LEN+DEX, and the incremental cost per QALY is below the threshold set by the World Health Organization.

Colorectal cancer screening for average risk individuals: An economic evaluation

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OBJECTIVES: In Canada, colorectal cancer (CRC) screening is recommended for average-risk individuals age 50-75. A variety of options are available for screening those at average risk for CRC, including stool-based tests (such as fecal occult blood test (FOBT), fecal immunochemical tests (FITs), and fecal DNA), radiological studies (such as Computed tomographic colonography (CTC)) and colonoscopy. Each modality differs in terms of test performance characteristics, invasiveness, safety and costs. The objective of this study is to perform an economic evaluation of CRC screening considering all of the available CRC screening modalities using a Canadian perspective.

METHODS: Using decision analysis, to compare CRC screening by FIT, fecal DNA, CTC and the most widely utilized CRC screening strategies (FOBT and colonoscopy) with no screening in average risk Canadians aged 50 to 74. Outcomes included the number of colonoscopies required, cancers, death from cancer, cost and cost per quality-adjusted life year (QALY) gained. Model inputs were obtained from the literature and a meta-analysis of adenoma prevalence. A lifetime horizon and 5% discounting was used in the analysis. All costs are reported in Canadian dollars and were inflated to 2007. RESULTS: In a hypothetical 100,000 patient cohort, we determined that CRC screening was cost-effective by conventional standards in comparison to the most common management of average risk Canadians (no screening). Although some uncertainty exists as to the optimal screening strategy, FIT appears to be the optimal strategy if the primary goal is to minimize the cost at which QALYs are purchased.