PIN18

PROJECTED CLINICAL BENEFITS AND COST-EFFECTIVENESS OF AN HPV 16/18 VACCINE

Goldie SJ[1], Kohli MA[2], Grima D[2], Weinstein MC[1], Wright TC[3], Bosch FX[4], Franco EL[5]

[1]Harvard School of Public Health, Boston, MA, USA; [2]Innovus Research Inc, Burlington, ON, Canada; [3]Columbia University School of Medicine, New York, NY, USA; [4]Institut Catala d'Oncologia, Barcelona, Spain; [5]McGill University, Montreal, QC, Canada

OBJECTIVE: To project the health and economic consequences associated with a prophylactic type-specific HPV-16/18 vaccine in the setting of a cervical cancer screening program. **METHODS:** A computer-based model of the natural history of cervical cancer that incorporates the type-specific HPV distribution within precancerous lesions and cancer was used to estimate cancer incidence and mortality, quality-adjusted life years (QALY), lifetime costs, and incremental cost-effectiveness ratios associated with different cancer prevention policies consisting of vaccination, screening, and combined vaccination/screening strategies. Strategies included (1) no vaccination and no screening; (2) no vaccination and cytology screening every 1, 2, 3, 4, and 5 years; (3) vaccination and cytology screening every 1, 2, 3, 4, and 5 years. Screening strategies included conventional and liquid-based cytology initiated at ages 18, 21, 25, or 30. We assumed vaccination occurred at age 12 and was 90% effective in reducing the probability of acquiring persistent infection with HPV 16/18, but evaluated the impact of alternative assumptions about vaccine efficacy and waning immunity. **RESULTS:** Vaccination at age 12 followed by triennial cytology screening beginning at age 30 provided reductions in cervical cancer mortality above those provided by annual conventional cytology and had an incremental cost-effectiveness ratio of below $50,000 per QALY compared to the next best strategy of vaccination and triennial cytology screening beginning at age 35. These results were stable over a range of vaccine efficacies (60% to 100%) but sensitive to the degree to which vaccination effect persists over time. **CONCLUSIONS:** A prophylactic vaccine that prevents persistent HPV 16/18 infection can be expected to significantly reduce HPV-16/18-associated high-grade lesions and cervical cancer even in a setting of cytology screening. A program of vaccination that permits a later age of screening initiation and a less frequent screening interval is likely to be a cost-effective use of health care resources.

PIN19

ECONOMIC IMPACT OF ANTIRETROVIRAL DRUG PRICE REDUCTIONS IN NINE LATIN AMERICAN COUNTRIES

Becker R, Hill J

Ovation Research Group, Highland Park, IL, USA

OBJECTIVE: A recent agreement to lower the price of antiretroviral drugs in several Latin American countries will decrease the cost of treating HIV/AIDS patients to levels similar to those in Brazil's established, prototypical universal access program. This analysis estimates the likely economic impact of these price reductions in nine countries (Argentina, Bolivia, Chile, Colombia, Ecuador, Mexico, Peru, Uruguay, Venezuela) compared to the economic impact afforded by Brazil. **METHODS:** The cost of two- and three-drug combination antiretroviral was estimated by applying 2000 Brazilian drug prices (in U.S. dollars). These costs were multiplied by each country's estimated HIV/AIDS population and by the rate of coverage given by Brazil's universal access program (14.4% of the HIV/AIDS population). The ratio of these estimated drug costs to gross domestic product (GDP) was determined to measure each country's relative ability to afford treatment. Similar calculations were made to include cost savings from averted hospitalizations due to antiretroviral care. **RESULTS:** Mexico, Colombia, and Argentina have the largest HIV/AIDS populations, and thus, the highest estimated annual drug costs ($91.8 million, $86.1 million, and $79.5 million, respectively). Bolivia and Uruguay have the lowest costs at $2.8 million and $3.8 million, respectively. Compared to Brazil's drug-cost-to-GDP ratio (0.026%), 6 countries are estimated to have lower ratios. Chile and Mexico have the lowest ratios (0.08% and 0.010%, respectively). Only Colombia (0.032%), Ecuador (0.029%), and Venezuela (0.026%) have higher ratios equal to or higher than Brazil's. Savings from averted hospitalizations reduced overall costs between 33% and 52% when triple-combination therapy is included in the program. **CONCLUSIONS:** For programs including triple-combination therapy, only Colombia and Ecuador may find the new drug program less affordable than Brazil. Countries with lower drug-cost-to-GDP ratios should be able to cover a higher percentage of patients than Brazil.

PIN20

THE IMPACT OF COST-EFFECTIVENESS OF COUNTRY SPECIFIC APPLICATION—THE CASE OF DROTRECOGIN ALFA (ACTIVATED) IN SEVERE SEPSIS

Persson U[1], Hjelmgren J[1], Ragnarson Tennvall G[1], Davies A[2]

[1]IHE, Lund, Sweden; [2]Medtap International, London, United Kingdom

OBJECTIVES: The purpose of this study was to assess the cost-effectiveness of drotrecogin alfa (activated) (DAA) as an adjunct to standard therapy compared to standard therapy alone for Swedish patients with severe sepsis by using 1) country specific cost and resource data compared to 2) exchange rate transferring of a UK model application based on the results from the clinical trial and UK treatment patterns. **METHODS:** In the PROWESS trial DAA has been found to decrease the all cause 28-day mortality in adult patients with severe sepsis. A C/E model was developed for estimating costs and outcomes and could be applied taking account of local treatment

patterns, costs, life expectancy, and discount rates. Patients with both an infection and at least one acute organ dysfunction diagnosis (ICD-10) recorded were selected from Huddinge university hospital in Sweden (n = 55). Direct costs for drugs, intensive care, and general wards up to 28 days, and to final discharge were determined according to the hospital resource and cost assignment system (2002 prices). The cost of DAA was based on the average use in the trial and the Swedish price 2002. **RESULTS:** The cost-effectiveness ratio of an adjunct drotrecogin alfa (activated) compared with standard therapy alone in the base case including patients with failure in at least two organs was €19,500 per QALY based on Swedish data. The corresponding figure was €13,700 when results were transferred by the exchange rate. Higher ICU costs in Sweden compared to UK account for 45% of the difference whereas higher life expectancy among the UK patients account for 55%. **CONCLUSIONS:** Drotrecogin alfa (activated) is cost-effective when compared to other accepted Health care interventions in Sweden. Local data application is important but does in this case not change the overall conclusion.

BUDGET IMPACT ANALYSIS OF UNIVERSAL VARICELLA VACCINATION IN GERMANY

Hammerschmidt T[1], Banz K[2], Goertz A[1], Wagenpfeil S[3], Neiss A[3], Wutzler P[4]

[1]GlaxoSmithKline, Munich, Germany; [2]Outcomes International, Basel, Switzerland; [3]Technical University Munich, Munich, Germany; [4]Friedrich-Schiller-University, Jena, Germany

OBJECTIVES: The dynamic infectious disease model EVITA (Economic Varicella VaccInation Tool for Analysis) has shown cost-effectiveness of universal varicella vaccination of children in Germany (Banz et al. 2003). However, affordability proves to be an additional hurdle. The aim of this analysis is to examine budget impacts of universal varicella vaccination from a payers' perspective. **METHODS:** EVITA was used to analyse budget impacts over 30 years (price level of 2002). Future costs were not discounted to show the full budget impact in future years. Targeted age-group for vaccination are children aged 1 year. Because in Germany no liability of vaccination for Kindergarten or school entry exists unlike in several US-states, we conservatively assumed coverage to increase linear from 7% to a maximum of 85% within 9 years and remain constant afterwards. These projected figures correspond to the slowest uptake in US-states in the first 6 years of universal varicella vaccination. **RESULTS:** Without vaccination, annual varicella costs amount to €72.6 million (23% outpatient, 25% inpatient, 52% work loss of parents staying at home to care for their sick child). Vaccination costs rise (proportional to coverage) from €3.9 to a maximum of €37.4 million and account at maximum for 0.03% of total payers' health care budget. Compared to no vaccination, varicella-related costs, i.e. varicella and vaccination cost, increase by 12% in the first 3 years. Then, savings through reduced morbidity occur which offset vaccination costs after 5 years. Over 30 years, average annual costs are reduced by 32% to €49.7 million. **CONCLUSIONS:** Varicella vaccination has a small impact on health care costs and does not influence insurance premiums. For a short time, investment in varicella vaccination causes additional costs, which are low compared to annual varicella costs. Reduced morbidity leads rapidly to savings. In the longer term significant net-savings occur.

MODELLING THE COST-EFFECTIVENESS OF THE VARICELLA VACCINE IN PORTUGAL

Portugal-Fernandes R, Andrea B
The University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

A safe, effective vaccine for chickenpox (varicella zoster) is available. However, some countries do not consider varicella vaccination a priority when compared with other childhood infectious diseases. It is important to Portuguese health policy to determine the economic value of vaccinating healthy children against chickenpox. **OBJECTIVE:** To estimate the cost-effectiveness of universal varicella vaccination compared with vaccination on demand. Design: Cost-utility analysis. Data sources: Costs were estimated from government sources (Administração Regional de Saúde de Lisboa e Vale do Tejo); vaccine efficacy data and utility values were derived from reports of clinical studies published in the peer-reviewed literature. Target Population: Portuguese children age 15 month. Time Horizon: Ten years. Perspective: Societal. Interventions: Universal vaccination as part of the National Vaccination Programme or the current situation in which vaccination is given on demand to children whose parents request it or can afford to pay for it. Outcomes measures: Costs, quality-adjusted life years (QALYs), cases of chickenpox prevented, and average cost-effectiveness ratios. Results of Base-Case Analysis: The average cost-effectiveness ratio proved to be dominant for the universal program compared with the actual situation. The cost per QALY is €16 or for each case prevented of €23. On demand vaccination is dominated by a the universal vaccination option, costing more and resulting in fewer QALYs and cases of chickenpox prevented. No substantive alteration of the base-case was noticed in a sensitivity analysis. **CONCLUSIONS:** A universal varicella vaccination program would be expected to improve quality of life and reduce the health care expenditures when used in young children.