ECONOMIC IMPACT OF 13-VALENT PNEUMOCOCCAL CONJUGATE VACCINE WITHIN THE PRIVATE MARKET IN BRAZIL

PINTO

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OBJECTIVES: To evaluate the cost-effectiveness (CE) immunization with 13-Valent Pneumococcal Conjugate Vaccine (PCV13) compared with no vaccination and also comparing with PCV10, considering direct effects in the Brazilian private market.

METHODS: A tree model was used to estimate the total number of cases of pneumococcal disease and disease sequelae caused by S. pneumoniae and the clinical outcomes were mortality and incidence rates. The vaccination coverage rate was 90%, considering a four-dose schedule, the pneumococcal disease according to the Brazilian label and the target population was a hypothetical birth cohort in Brazil followed 5 years by the Brazilian Private Market Health care system perspective.

RESULTS: Considering only direct costs and benefits, the program with PCV13 compared with PCV10 will avoid 60.652 cases of disease including pneumonia and invasive disease, and also 133.615 saved life years. At a current vaccination’s price (PCV13 cost of R$ 198,11 and PCV10 R$ 150,90) the CE results will be R$ 3.976,00 for life years gained and R$ 8.760,00 for disease averted. Considering the same price for PCV13 and PCV10, PCV13 will achieve cost-saving results. The program with PCV13 compared with no vaccination will avoid 204,307 cases of disease including AOM, pneumonia and invasive disease, and also 163.165 saved life years. The CE results will be R$ 11.086,00 for disease averted.

CONCLUSIONS: The analysis suggests that the PCV13 within the Brazilian private market expected to be very cost-effective relative to PCV10 and to no vaccination. Considering the same price, PCV13 compared to PCV10 may result in reduction of mortality with resultant cost savings (R$ 35 Million).

COST-EFFECTIVENESS OF THE ACIP RECOMMENDED ADULT IMMUNIZATION SCHEDULE IN THE US

PIN21

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OBJECTIVES: To estimate the cost-effectiveness of the Advisory Committee on Immunization Practices (ACIP) recommended schedule of adult immunizations in the US.

METHODS: A cost-effectiveness calculator was constructed for the ACIP recommended schedule following and including the 2006 schedule and followed an active- and passive- plus vaccination strategy for US-age-weighted cohort. The intervention in the model included the following vaccination strategies: influenza (annually, age 50+), Hepatitis A/B (A/B Hep A/B, college students age 18), Human Papillomavirus (HPV, women age 18–26), Pneumococcal Polyvalent Vaccine (PPV, age 50+), Tetanus-Diphtheria acellular Pertussis (Tdap, age 20), Varicella (age 20+), and Zoster (age 60+). Per-person estimates of discounted costs (2008$) and quality adjusted life years (QALYs) were derived from existing cost-effectiveness studies of target vaccinations vs. no vaccination. Two approaches were taken—cross-sectional and longitudinal. In the cross-sectional approach, members of a hypothetical US age-weighted cohort were assumed to receive the vaccinations for which they were eligible in a single lifetime, lifetime incremental costs and QALYs were summed over the cohort, and an aggregate ICER calculated. In the longitudinal approach, incremental costs and QALYs from existing studies were applied to a cohort of 18-year-olds at the appropriate age for each vaccine costs and QALYs to the present, summed, and an aggregate incremental cost-effectiveness ratio (ICER) was calculated.

RESULTS: Estimated ICERs were $7300/QALY and $8000/QALY for the cross-sectional and longitudinal approaches, respectively. Both approaches are influenced by inclusion of influenza vaccinations, however excluding influenza still results in cost-effective ICERs (below $30,000/QALY (cross-sectional) and below $20,000/QALY (longitudinal)). In contrast, removing HPV, Hep A/B, PPV, Tdap, Varicella, or Zoster individually from the immunization schedule does not markedly alter the ICER. Advancing the cohort starting age from 18 to 65 years decreases the ICER to $5000/QALY (longitudinal). In contrast, removing HPV, Hep A/B, PPV, Tdap, Varicella, or Zoster individually from the immunization schedule does not markedly alter the ICER. Advancing the cohort starting age from 18 to 65 years decreases the ICER to $5000/QALY (longitudinal). In contrast, removing HPV, Hep A/B, PPV, Tdap, Varicella, or Zoster individually from the immunization schedule does not markedly alter the ICER. Advancing the cohort starting age from 18 to 65 years decreases the ICER to $5000/QALY (longitudinal).

CONCLUSIONS: The analytic approach, adult immunization according to the current ACIP schedule is cost-effective.

COST-EFFECTIVENESS ANALYSIS OF LINEZOLID VS VANCOMYCIN IN EMPIRIC TREATING MECHANIC VENTILATION-ASSOCIATED PNEUMONIA BY METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS (VAP-MRSA) IN COLOMBIA

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OBJECTIVES: To evaluate the cost-effectiveness of Linezolid versus Vancomycin in treating VAP-MRSA in Colombia.

METHODS: The model simulated costs and effectiveness in a temporal horizon of 12 weeks, a third-payer perspective was used. Effectiveness and outcome measures were defined as life-years gained (LYs). Clinical efficacy and node probabilities were obtained by systematic literature review of published clinical trials, which estimated direct costs associated with VAP-MRSA treatment (drugs, hospitalization, and costs associated with adverse events). Medical costs from 3 major Colombian cities were used; drug costs were taken from a standard costing source. Incremental cost per successfully treated patient (ICERs), one and two-way sensitivity analysis of key variables were performed. Model outputs are presented with 95% uncertainty intervals.

RESULTS: Patients treated with LIN experienced the highest outcomes (6.6 LYs) followed by VAN (4.2 LYs). Mean cost per patient was lower for LIN (US$3150) compared to VAN (US$4400). The CER was better for LIN (US$474/LYs) compared to VAN (US$800/LYs). CONCLUSIONS: Linezolid is cost-saving treatment compared to vancomycin in empiric treating mechanical ventilation associated pneumonia by methicillin-resistant Staphylococcus aureus in Colombia.

AN INITIAL COST-EFFECTIVENESS ANALYSIS OF THE NEW 13-VALENT PNEUMOCOCCAL CONJUGATE VACCINE (PCV-13) VERSUS PCV-7 IN THE PUBLIC SECTOR OF HONG KONG

PINTO

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OBJECTIVES: Local cost-effectiveness studies using local health data have supported the long-term health and economic benefits of the PCV-7 due to herd immunity and have led to its inclusion in the routine immunization programme for infants in Hong Kong since September 2009. PCV-13 is due to be introduced in 2010. The aim of the present study is to compare its clinical and economic impacts to those of the existing PCV-7 on the whole population of Hong Kong.

METHODS: A decision analytical model modified from the recent Prevent-13 Economic Impact (PREVENT) Model (RTI Health Solution) was used for the analysis of the outcomes of vaccination. The entire population of Hong Kong of around 7 million was analyzed with infants ≤ 2 yo receiving PCV-7 vs PCV-13. Population data, incidence rates, serotype coverage, age, disease sequelae, mortality rates, vaccine effectiveness, duration of protection, herd effects, utilities, cost of vaccination, direct and indirect costs were adopted from local published studies, previous economic assessments of PCV-7 and PCV-13 and local government figures to populate the model. Sensitivity analyses were performed to check the robustness of the results. The time horizon was one year and the study was performed from a societal perspective.

RESULTS: Over a period of 1 year, based on an assumption of 85% coverage in infants, our analysis showed for a 4-dose regimen of PCV-13 as compared to a 4-dose PCV-7: a gain of 6 life-years and 5 quality-adjusted-life-years (QALYs); an avoidance of 108 related illnesses (including bacteraemia, all-cause pneumonia, meningitis and otitis media) and 1 death; cost/QALY of Hong Kong of around 34–81. Averted DALY in the base year was 4,262 (4,127 US$ per averted DALY), and in the fifth year was 21,187 (543 US$ per averted DALY). In univariate analysis, at a cost of US$10 the vaccine resulted in 817 US$ per averted DALY for the base case.

CONCLUSIONS: In developed countries immunization with PCV23 is recommended in adults older than 60 years and other groups. This study shows that in Colombia, a developing country, this vaccine is cost-effective, at a GDP per capita of US$5000 in 2008. Despite the results, estimations would be different if the effectiveness of the vaccine in this population was significantly different than assumed.

COST-EFFECTIVENESS ANALYSIS OF ERTAPENEM VS THE PATTERNS OF ANTIBIOTICS ROUTINELY USED FOR TREATMENT OF DiABETIC FOOT INFECTIONS AT THE LOCAL SECURITY MEXICAN INSTITUTE

PINTO

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OBJECTIVES: Diabetic foot infection is a frequent complication for diabetes patients that lead to high economical costs. The purpose of this study was to develop an eco-
nomic model in order to evaluate the cost-effectiveness ratios between ertapenem and the patterns of antibiotics routinely used for the treatment of diabetic foot infections at the Social Security Mexican Institute (IMSS) from the health care payer’s perspective.

METHODS: A cost-effectiveness analysis was conducted using a Bayesian decision-tree model. The model simulates costs and effectiveness outcomes in a 3-year period. The model was calibrated according to the patterns of antibiotics used in respondents. Efficacy and safety data, as well as duration of IV phase associated with ertapenem (1 g daily), metronidazole (500 mg every 8 h)/ceftriaxone (1 g every 12 h); metronidazole (500 mg every 8 h)/levofloxacin (500 mg every 12 h); resource use and cost data were obtained from hospital (second level) records of 104 of treated patients. Effectiveness measures were the percentage of clinical success without adverse events (AE) at the end of the follow-up period. Effectiveness data and transition probabilities were taken from international published literature and were adjusted according to the antimicrobial susceptibility identified locally. The model was calibrated according to the international pharmacoeconomics guidelines. One-way and probabilistic sensitivity analyses were performed using Monte Carlo Simulation second-order approach.

RESULTS: Patients who received ertapenem experienced 62.7% of clinical success without AE, followed by metronidazole/ceftriaxone (23.9%) and metronidazole/levofloxacin (17.8%). Mean cost per patient were lower for ertapenem ($US4306.46) followed by metronidazole/ceftriaxone ($US8625.11). Based on ICER ertapenem resulted as the dominant therapy. Acceptability curves showed ertapenem as the most cost-effective therapy closer to 100% independently of IMSS willingness to pay. CONCLUSIONS: The results show that in México, ertapenem is the most cost-effective antibiotic therapy for diabetic foot infections. These results should be taken into account by Mexican decision makers for the management of this complication in patients with Diabetes Mellitus.

**CONFLICTS OF INTEREST:** None.

**FUNDING:** This study was supported by the FUDASAI Bogotá, Colombia, and the FIS grant from the IMSS.

**ABSTRACT:** This study was conducted using Pubmed. A decision tree model was developed to infer the most cost-effective regimen using data from randomized clinical trials. Cost in the model included drug cost, primary physician visit cost, follow-up physician visit cost, and adverse drug event costs, and were obtained from published literature. Rash and hepatotoxicity were the adverse events considered in the model as these were highly associated with these treatment regimens. Completion rate (adherence to the medication regimen) was the outcomes evaluated. One-way sensitivity analyses were conducted by varying various costs by 10% to check for the robustness of the model.

**RESULTS:** The base-case analysis revealed rifampin-rifampinpyrazinamide to be the most cost-effective regimen. The one-way sensitivity analysis indicated the results to be robust. The total cost for treatment with isoniazid was $1,860.53, rifampin was $2,113.55, and rifampin-rifampinpyrazinamide combination was $978.69. The adherence rate to isoniazid treatment was 53% as compared to rifampin and rifampin-pyrazinamide which was found to be 70% and 81% respectively. Rifampin-pyrazinamide associated with hepatoxicity (4%) as compared to isoniazid (1.5%) and rifampin (3%) stillshowed the best cost-effectiveness (horizons: 12 weeks). The model estimated from rifampin-pyrazinamide regimen to isoniazid was $86.87 and to rifampin was $237.02. CONCLUSIONS: These analyses based on the data from randomized clinical trials, shows that rifampin-pyrazinamide was indicated to be the cost effective treatment for patients with latent TB, as compared to isoniazid and rifampin alone.

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