INFECTIONS—Cost Studies

COST-EFFECTIVENESS OF INTRAVENOUS IMMUNOGLOBULIN MANUFACTURED FROM CHROMATOGRAPHY-CAPRYLATE VS. SOLVENT-DETERGENT METHODS IN PERSONS WITH PRIMARY IMMUNODEFICIENCY DISEASE

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OBJECTIVES: Intravenous immunoglobulin (IVIG) made from chromatography-caprylate methods (IVIG-C, 10%) was associated with a reduction in validated infections (pneumonia, sinusitis and acute exacerbation of chronic sinusitis) when compared to IVIG made from solvent-detergent methods (IVIG-SD, 10%) in patients with primary immunodeficiency disease. Our objective was to determine the cost-effectiveness of IVIG-C.

METHODS: We performed a retrospective economic analysis of a double-blind, randomized, clinical trial. Participants were randomly assigned to IVIG-C (n = 87) or IVIG-SD (n = 85) and monitored for the development of validated infections over the course of 9 months. Consumed resources were enumerated including cost of physician and emergency room visits, medications (prescription and over-the-counter), work productivity losses and hospitalizations. Resource data was obtained from case report forms, patient diaries and the trial medication database. Unit costs were obtained from national costing sources (Thomson’s Redbook, Health Care Utilization Project database), etc. Pricing of both IVIG products was the same therefore IVIG acquisition costs were not included in the analyses. We used a societal perspective with indirect costs, measured in 2003 U.S. dollars.

RESULTS: In a multivariate analysis, mean per participant costs were significantly lower between those receiving IVIG-C compared to IVIG-SD for prescription medications ($302, 95% CI: -$598, -$6), hospitalization ($1454, 95% CI: -$1828, $1080) and total costs ($1304, 95% CI: -$1867, -$742). Participants costs associated with lost work productivity and physician visits were similar for both groups (p > 0.10). In sensitivity analyses, using 80% of average wholesale price for participant costs associated with lost work productivity and economic outcome differences in the care. Incremental health benefits therefore it is a dominant strategy to IGIV made from solvent-detergent methods (IGIV-SD, 10%) was associated with statistically lower total costs than levofloxacin, while clarithromycin was not significantly different. When limiting the assessment to only newer agents, azithromycin (49.2% lower) and clarithromycin (21.7% lower) were associated with lower total costs relative to levofloxacin. Additionally, in subjects with a CDS above the sample’s mean, only azithromycin was associated with lower total costs (49.2% lower) relative to levofloxacin, with no differences observed concerning treatment success. CONCLUSIONS: This real-world analysis of managed care patients found that erythromycin, azithromycin, and clarithromycin were associated with significantly lower total costs than levofloxacin, without differences in treatment success rates. Following stratification based upon various subset criteria, erythromycin and azithromycin were observed to have significantly lower total costs than levofloxacin.

ECONOMIC COST STRUCTURE OF SEVERE SEPSIS MANAGEMENT

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OBJECTIVES: International studies have reported the overall cost per patient associated with severe sepsis. However, there is a lack of understanding about how the treatment cost and resource utilization varies with failure of one or more organs. This study was conducted to: 1) identify cost element flow and frequency of resource use to estimate aggregated cost for typical ICU medical and surgical severe sepsis patients with various organ dysfunctions, and 2) determine the prevalence of type of organ failures and cost associated with the management in severe sepsis patients with failure in two organs. METHODS: Retrospective review of the GSH administrative database from 1999 to 2002 of ICU severe sepsis patients (n = 889). Sepsis and organ failure classification was based on reported ICD-9-CM codes. Resource utilization and cost data, through day 28, were obtained from both ICU and non-ICU cost centers. RESULTS: A matrix of the frequency of resource utilization and average cost per resource associated with the severe sepsis treatment was generated. Resource categories included: room & board, nursing, medications, operating room, laboratories, diagnostics, physical therapy, and organ related treatment. The mean LOS was 16.6 ± 15 days for all severe sepsis patients. Survivors had an average 6 days greater LOS than non-survivors. The mean total cost per severe sepsis patient abstracted was $29,590 ± $24,673 ($1,594/day) for survivors, $27,837 ± $29,445 ($2,268/day) for non-survivors, and $27,548 ± $22,824 ($1,620/day) for sepsis patients with 2 acute organ failures. Highest prevalence among patients with two organ dysfunctions was Respiratory + (Cardiovascular or Renal) organ failures. Average hospital mortality of severe sepsis patient was 30.2%.
CONCLUSIONS: Retrospective database analysis has yielded a previously unavailable resource allocation and cost structure that illuminates our understanding of severe sepsis management economics.

THE COST OF TREATMENT FAILURE IN ACUTE BACTERIAL MAXILLARY SINUSITIS
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OBJECTIVE: Although treatment failure can substantially increase medical-care costs, data on the economic impact of treatment failure in acute bacterial maxillary sinusitis (ABMS) are lacking. The absence of these data undermines efforts to incorporate pharmacoeconomic criteria in clinical decision-making (beyond simplistic comparisons of the acquisition costs of competing antibiotics). We conducted this study to document the cost of treatment failure in ABMS. METHODS: Data were obtained from a prospective, randomized, double-blind, equivalency study in which adults with radiographic evidence of ABMS were randomized to treatment with telithromycin 800 mg once a day for 5 days followed by placebo for 5 days (n = 159) or moxifloxacin 400 mg once a day for ten days (n = 163). Patients were asked to record in a study diary all nonprotocol sinusitis-related health-care utilization over a 30-day follow-up period, including outpatient visits, tests and procedures, prescription medications, and over-the-counter remedies. Unit costs were assigned to all measures of health-care utilization using nationally representative published sources. All utilization and cost measures were analyzed irrespective of treatment assignment and compared between patients who were treatment “successes” versus “failures”, as assessed for the primary efficacy endpoint. RESULTS: A total of 253 subjects were declared treatment successes and 47 treatment failures. Treatment failures incurred sinusitis-related medical-care costs that were nearly sixfold higher than treatment successes ($126.11 vs $21.98; p < 0.001), reflecting higher mean utilization of unscheduled outpatient services (0.40 vs 0.10 visits; p = 0.009), tests and procedures (0.32 vs 0.08; p = 0.002), and nonstudy prescription medications (1.23 vs 0.39; p < 0.001). Use of over-the-counter drugs did not differ significantly (0.68 vs. 0.54 units purchased; p = 0.763). CONCLUSIONS: The cost of treatment failure in ABMS appears to be substantial. Clinical decision-making regarding choice of antibiotic therapy in ABMS should involve consideration of how treatment failure might increase overall costs of sinusitis-related care.

COST-EFFECTIVENESS MODELING OF TREATMENT APPROACHES TO HEPATITIS C: A MANAGED CARE PERSPECTIVE
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OBJECTIVES: To present pharmacoeconomic evidence supporting the relative cost-effectiveness of two pegylated interferon therapies, compared with the standard interferon and ribavirin therapy, for hepatitis C treatment. METHODS: Evidence-based decision analysis based on genotypes, treatment dose and duration, comparing the pharmacoeconomic benefits of PEGASYS + COPEGUS (peginterferon alfa-2a + ribavirin) versus REBETRON (interferon alfa-2b + ribavirin) and PEG-Intron + REBETOL (peginterferon alfa-2a + ribavirin) versus REBETRON. Cost effectiveness is calculated in terms of the cost per sustained virological response (SVR); timeframe includes the course of therapy and treatment-free follow-up of 24-weeks. The model adopts a managed care perspective and includes only direct costs. Each therapy efficacy rates, total costs, costs associated with diagnosis, medical treatment, drug acquisition and adverse events are calculated for base-case scenario and sensitivity analyses. RESULTS: Drugs accounted for the largest portion of total costs, followed by adverse events, diagnostic procedures and medical treatment. The total costs associated with PEG-Intron+REBETOL ($29,510) compared with REBETRON ($25,864) imply an incremental cost-effectiveness ratio (ICER) for PEG-Intron+REBETOL versus REBETRON of $60,767. PEGASYS + COPEGUS provide an increased probability of treatment success at a lower cost than REBETRON. Compared with REBETRON, the combination of PEGASYS + COPEGUS is deemed a dominant strategy. The results of the sensitivity

COST-EFFECTIVENESS OF FOUR ANTIMICROBIAL REGIMENS IN PATIENTS ADMITTED TO THE MEDICAL FLOOR WITH CLASS IV OR V COMMUNITY-ACQUIRED PNEUMONIA
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OBJECTIVE: This study evaluates the cost-effectiveness of four antimicrobial regimens (e.g., levofloxacin monotherapy, ceftriaxone monotherapy, ceftriaxone plus a macrolide, and ceftriaxone plus levofloxacin) for the treatment of patients admitted to the medical floor with class IV or V community-acquired pneumonia (CAP). METHODS: All adult patients with a principal discharge diagnosis of pneumonia, admitted to Baptist-Health System from November 1, 1999 to April 30, 2000 were evaluated. Medical floor patients who met criteria for Pneumonia Severity Index (PSI) risk class IV or V were included in this analysis. Total hospital charges were converted to costs using the hospital cost-to-charge ratio. Wilcoxon Rank Sum was used to evaluate associations between antimicrobials received (independent variable) and total hospital cost (dependent variable). Cost-effectiveness ratios were determined by dividing the total hospital cost by the percent survival. RESULTS: A total of 649 patients were managed on the medical floor with 415 (64%) meeting the criteria for PSI risk class IV (N = 274) or V (N = 141) CAP. Costs (median, 25th and 75th quartile) were as follows: total hospital cost ($4087 [$2590–$6534]), pharmacy costs ($606 [$366–$1092]), and antibiotic costs ($112 [$66–$184]). Total hospital costs were lowest for levofloxacin monotherapy (N = 151, $3506 [$2231–$5870]), followed by ceftriaxone monotherapy (N = 61, $3758 [$2741–$6071]), ceftriaxone plus a macrolide (N = 61, $4163 [$3100–$5726]), and ceftriaxone plus levofloxacin (N = 38, $4830 [$2934–$5793]) (P = 0.08211). Survival was the highest for patients who received ceftriaxone plus a macrolide (98%), followed by ceftriaxone plus levofloxacin (95%), levofloxacin monotherapy (94%), and ceftriaxone monotherapy (87%) (P = 0.0734). The most favorable cost-effectiveness ratio was observed for patients who received levofloxacin monotherapy ($3730 per expected cure), followed by ceftriaxone plus a macrolide ($4248), ceftriaxone monotherapy ($4370), and ceftriaxone plus levofloxacin ($5367). CONCLUSION: Among patients admitted to the medical floor for class IV or V CAP, levofloxacin monotherapy is the most cost-effective antimicrobial regimen.