

OBJECTIVES: Iatrogenic chronic pain is increasingly recognized as a major adverse outcome after inguinal hernia repair. In order to assess chronic post-herniorrhaphy pain, we developed the 18-item Inguinal Pain Questionnaire (IPQ). The aim of the present study was to test its validity and reliability and explore the prevalence of long term pain as determined by the questionnaire in a sample from the population-based Swedish Hernia Register. **METHODS:** Validity was tested in 100 patients who received the IPQ and the Brief Pain Inventory (BPI) 1 and 4 weeks after surgery (Group A). The reliability was tested in 100 patients who received the IPQ on two occasions one month apart 3 years after operation (Group B). From the Swedish Hernia Register 2853 operated 2000 were requested to fill in IPQ by mail. **RESULTS:** As an indication of construct validity, a significant ($p < 0.001$) decrease in IPQ-rated pain intensity was observed in the first 4 weeks after surgery. Significant ($p < 0.05$) correlations with corresponding BPI pain intensity items corroborated the criterion validity. The rate of logical incoherence did not exceed 5.5% for any item. Kappa values in the test-retest one month apart in group B were higher than 0.5 for all but three items, indicating acceptable reliability. Cronbachs alpha was 0.83 for questions on pain intensity and 0.51 for interference with daily activities. After two reminders, 2456 patients (86%), in the sample from the Hernia Register had responded to the questionnaire. In response to a question about "worst perceived pain last week", 758 patients (31%) reported pain to some extent. In 144 cases (6%) the pain interfered with daily activities. **CONCLUSION:** The validity and reliability is sufficient to make IPQ a useful instrument in the routine assessment of post-herniorrhaphy pain. Disabling pain was found to be a widespread problem 3 years after surgery.

RESPIRATORY DISEASES—Clinical Outcomes Studies

PRSI

BURDEN OF CONCOMITANT ASTHMA AND COPD IN A MEDICAID POPULATION

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OBJECTIVES: Asthma and chronic obstructive pulmonary disease (COPD) present health concerns and an economic burden for patients and managed care plans. This study compares utilization outcomes in patients with COPD, asthma or co-occurring COPD and asthma in a Medicaid population. **METHODS:** We queried all medical and pharmacy claims of Medicaid patients with COPD and/or asthma filed between January 1, 2000 and December 31, 2003, from encounter data. COPD patients were identified based on at least one claim with ICD-9 codes 491, 492, 496, and asthma patients on the basis of ICD-9 code 493 as primary, secondary or tertiary diagnosis. We analyzed annual utilization attributable to COPD and/or asthma, and compared relative utilization of hospitalizations, physician, outpatient and emergency room visits as well as drug prescriptions. **RESULTS:** The analysis included a total of 3455 COPD, 3072 asthma and 2604 COPD/asthma patients, and showed statistically significant differences in the use of services. COPD/asthma co-occurring disease has higher utilization of any service type than either disease alone. Compared with asthma, COPD has higher use of hospitalizations ($p < 0.0001$), and less out-patient services ($p < 0.0001$) and outpatient-emergency visits

($p < 0.0001$). Logistic regression results suggest that COPD patients were 16%-51% more likely to use physician visits (OR = 1.16, 95% CI: 1.01–1.34) and inpatient services (OR = 1.51 95% CI: 1.31–1.74) and less likely to use out-patient services (OR = 0.40 95% CI: 0.35–0.46). COPD and asthma co-occurring patients had higher utilization of all services compared with asthma patients. **CONCLUSION:** Our data suggest that COPD and COPD/asthma co-occurring patients were sicker and used more medical services than asthma patients.

PR52

CLINICAL OUTCOMES OF PATIENTS HOSPITALIZED WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) EXACERBATIONS IN SINGAPORE

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OBJECTIVES: To review the clinical outcomes of patients hospitalized with chronic obstructive pulmonary disease (COPD) acute exacerbations in Singapore and to describe the impact of evidence-based management programs. **METHODS:** A retrospective review was designed for COPD exacerbations patients admitted from year 2000 to 2005 in three public hospitals in Singapore. Adult patients aged 40 years and above with COPD as the primary reason for hospitalization were retrieved from computerized database. The outcomes studied included average hospital length of stay (LOS), in-hospital mortality rate and readmission rates within 15 days, 30 days and 90 days. Univariate ANOVA and Chi-square test, multivariate regression models and trend analysis were applied to generate statistical results. **RESULTS:** Among all 2996 COPD patients, 78.8% were male (95% CI: 77.3–80.3%). Chinese were about 82.4% (95% C.I.: 81.0–83.8%), Indian 6.6% (95% CI: 5.7–7.5%), and Malay 7.8% (95% CI: 6.8–8.8%). Patients aged 60 and above were the major population, taking up to 90.4% (95% CI: 89.3–91.5%). From 2000 to 2005 there were significant declines in LOS (6–3 days; $p < 0.001$), and mortality (12.1–3.7%; $p < 0.001$) rates. There were also significant reduction in readmission rates at 90 days (22.5–13.6%; $p < 0.001$) but not at 30 days (11.8–8.6%; $p = 0.076$) or 15 days (6.5–6.0%; $p = 0.218$). By multivariate regression, by controlling other factors, age is a risk factor for longer hospital LOS ($p = 0.02$). Elder patients are also more dangerous on in-hospital death ($p < 0.001$) and readmission within 90 days ($p = 0.043$). All the readmission rates for male patients were significantly higher than females ($p = 0.002$, $p < 0.001$ and $p < 0.001$ for 15, 30, and 90 days respectively). **CONCLUSION:** In summary, although the study suffers from several limitations, i.e. lack of controls, confounded by disease severity etc, it has shown that implementation of goal directed management programs in COPD patients was associated with positive trends in reduced hospitalization, hospital mortality and readmission rates.

RESPIRATORY DISEASES—Cost Studies

PR53

DIRECT AND INCREMENTAL COSTS OF ACUTE RESPIRATORY INFECTIONS BY INITIATING ANTIBIOTIC

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OBJECTIVES: The costs of respiratory tract infections are considerable. The purpose of this study was to estimate the direct

and incremental costs of three different types of respiratory infections: acute sinusitis (AS), acute otitis media (AOM), and community-acquired pneumonia (CAP). **METHODS:** Data were from the Marketscan claims databases July–December 2004. Respiratory disease episodes were constructed via ICD9 codes on an index and surrounding claims. The antibiotics most frequently prescribed initially for each type of infection were identified. Logistic regression estimated a propensity score for each patient; which was the predicted probability of using a reference drug, telithromycin. Patients were matched according to this probability and exponential conditional means models (ECM) were specified, controlling significant variables after the propensity score matching (demographics and comorbidities). These models allowed incremental costs to be estimated for treatment with the reference drug, telithromycin, relative to other antibiotics. **RESULTS:** There were 86,232 AS, 71,884 AOM (10% were among patients under 18) and 5236 CAP episodes. The most commonly used antibiotic for initial treatment was amoxicillin for AOM, and AS and azithromycin for CAP. Total costs were \$182 for AS, \$192 for AOM and \$897 for CAP. The highest incremental cost saving associated with telithromycin was relative to moxifloxacin in CAP (\$484; $p < 0.001$). The highest incremental cost saving with another antibiotic relative to telithromycin was \$23.43 ($p < 0.001$) in the AS episodes initiated with azithromycin. **CONCLUSION:** The multivariate results showed that after propensity matching and controlling for intra-episode differences, that direct costs did indeed vary by the initiating antibiotic. It is of interest to note that the results did not uniformly favor one agent over another. Although different antibiotics may be included in the same drug class, there are clearly differentials between these drugs to consider not only clinically, but also for financial implications as well.

PR54

AN ECONOMIC EVALUATION OF FIRST LINE ANTIBIOTICS FOR THE INPATIENT TREATMENT OF ACUTE EXACERBATIONS OF CHRONIC BRONCHITIS IN MEXICO
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OBJECTIVES: The purpose of the study was to evaluate economic and health consequences of first line antibiotics treatment for inpatient therapy in Mexican patients with acute exacerbations of chronic bronchitis (AECB) from the health care payer's perspective. **METHODS:** A cost–effectiveness assessment was performed employing two economic models. First, a three-month decision tree model was used to compare costs and effectiveness associated to acute exacerbations treatments. Second, a one-year Markov model was created to compare costs and effectiveness associated to AECB recurrences. Model comparators were: gemifloxacin 320 mg/day, moxifloxacin 400 mg/day, levofloxacin 500 mg/day, ceftriaxone 1 gr/day, gatifloxacin 400 mg/day, clarithromycin 1000 mg/day and cefuroxime 1000 mg/day. The effectiveness measures were the % of clinical success and the number of free months of recurrences/hospitalizations. Resource use data was obtained from hospital records inside the General Regional Hospital No. 1 “Gabriel Mancera” at the Social Security Mexican Institute (IMSS) in Mexico City ($n = 117$). All drug prices and resource use costs were taken from official institutional databases from the IMSS. One-way and probabilistic sensitivity analyses were performed and components analyses were elaborated. **RESULTS:** Gemifloxacin showed the lowest expected costs (US\$2750.2); the highest % of clinical success among all alternatives (97.5%) and the shorter hospitalization stay length

(approximately 6.1-days). The total days reduction generated by gemifloxacin could reduce total hospitalization costs in \$US1269.5 per acute exacerbation. Markov model results for free months of recurrences showed that gemifloxacin first line therapy for AECB could give patients in average 11.1-free months of recurrences/hospitalizations followed of ceftriaxone (10.9-months) and moxifloxacin (10.5-months). The results were robust to first-order Monte Carlo simulations and acceptability curves. **CONCLUSION:** Gemifloxacin is the most cost effective first line treatment for inpatients with AECB, because its high effectiveness, significant inpatients day's reduction and more free months of recurrences. These results could be used by Mexican decision-makers to generate future cost-containment strategies.

PR55

COST—EFFECTIVENESS ANALYSIS OF FIRST LINE ANTIBIOTICS FOR THE INPATIENT TREATMENT OF PATIENTS WITH COMMUNITY ACQUIRED PNEUMONIA IN A PUBLIC MEXICAN HOSPITAL

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OBJECTIVES: The purpose of the study was to estimate the incremental cost-effectiveness ratios (ICER) among the first-line antibiotics for the inpatient treatment of Mexican patients with community acquired pneumonia (CAP) from the health care payer's perspective. **METHODS:** A cost–effectiveness analysis was performed with the aid of a decision tree model. The model had a two-month period to assess economic and clinical consequences of seven first-line antibiotics used in the study: Gemifloxacin 320 mg/day, Clarithromycin 1000 mg/day, Levofloxacin 500 mg/day, Gatifloxacin 400 mg/day, Ceftriaxone 1 gr/day, Cefuroxime 1500 mg/day and Moxifloxacin 400 mg/day. Adverse events of each therapy were considered (rash, diarrhea, dizziness, vomits, chill and head pain). Resource use data was obtained from hospital records from the General Regional Hospital No. 1 “Gabriel Mancera” at the Social Security Mexican Institute (IMSS) in Mexico City ($n = 94$). All drug prices and unit costs were taken from official institutional databases within the IMSS. Effectiveness measures used in the model was the % of therapeutic success among the multiple antibiotics. One-way and probabilistic sensitivity analyses were performed and acceptability curves were constructed. **RESULTS:** Gemifloxacin showed the lowest average health care costs in inpatient treatment (US\$ 2389.8) due to a significant reduction in the hospitalization days (approximately 4.61 days in average per patient). The length of stay reduction was associated with the shorter treatment of gemifloxacin (five-days). Gemifloxacin showed the highest effectiveness (95.3%) followed by clarithromycin (94.3%); levofloxacin (94.0%); gatifloxacin (92.0%); ceftriazone (91.3%); cefuroxime (90.0%) and moxifloxacin (86.5%). The ICERs for all treatments were dominated by gemifloxacin. First-order Monte Carlo simulations showed the same results. **CONCLUSION:** Gemifloxacin was the most cost effective first line treatment for hospitalized patients with CAP, especially, because it's high effectiveness and its significant inpatient-stay length reduction.

PR56

EVALUATING THE COST-EFFECTIVENESS OF TIOTROPIUM IN THE TREATMENT OF MODERATE CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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