

PIN28

COST-OF-ILLNESS ANALYSIS OF CANDIDEMIA IN PATIENTS ON THE INTENSIVE CARE UNIT

Heimann S, Cornely OA, Wisplinghoff H, Vehreschild MJ, Franke B, Glossmann J, Vehreschild J

University Hospital of Cologne, Köln, Germany

OBJECTIVES: Direct and indirect costs caused by candidemia in ICU patients are currently unknown. We performed an analysis comparing costs depending on the type of antifungal treatment. **METHODS:** Data of patients from the University Hospital of Cologne with at least one blood culture positive for *Candidasp.* while staying on the ICU between 2005 and 2010 were documented into a database. Indirect costs caused by illness-conditioned disability and death before retirement age were calculated using the friction cost method. Analysis was split for patients treated with new antifungals (i.e. echinocandins, liposomal amphotericin B, or voriconazole) or conventional antifungals (i.e. amphotericin B deoxycholate or fluconazole). **RESULTS:** Out of 147 identified patients, 45 received new and 66 conventional antifungals, and 36 patients were excluded from analysis (21 died within 96 hours after positive blood culture, seven were rated as contamination, eight patient files were missing). Mean APACHE IV score was 113 (105.7-121.2) vs. 96 (90.3-100.8, $P < 0.001$). Mean direct costs per patient in the new and the conventional antifungal groups were as follows: ICU treatment 24,922 € (95% CI: 17,054-31,789 €) vs. 17,971 € (95% CI: 13,203-22,740 €, $P = n.s.$), antifungal treatment 4,271 € (95% CI: 2,983-5,560 €) vs. 2,079 € (95% CI: 1,246-2,912 €, $P = 0.005$), total direct costs 41,060 € (95% CI: 30,184-51,935 €) vs. 28,885 € (95% CI: 22,116-35,654 €, $n.s.$), indirect costs per patient due to productivity loss of illness-related disability 1,202 € (95% CI: 474-1,930 €) vs. 1,087 € (95% CI: 570-1,604 €, $n.s.$), due to death before retirement age 1,047 € (95% CI: 236-1,858 €) vs. 1,309 € (95% CI: 584-2,034 €, $n.s.$). Twenty-five (56%) and 33 (50%) patients survived hospitalization, 20 (44%) and 22 (33%) patients survived one year after diagnosis. **CONCLUSIONS:** Our cost-of-illness analysis shows the high treatment costs of patients with candidemia. In our analysis, treatment with new antifungals was associated with higher costs. Although sicker patients were significantly more likely to receive new antifungals, outcomes were comparable to less sick patients treated with conventional antifungals.

PIN29

LENGTH OF STAY AND COST DUE TO RECURRENT CLOSTRIDIUM DIFFICILE INFECTIONS (CDI) AT A UNIVERSITY HOSPITAL IN FINLAND

Agthe N¹, Mattila E², Purmonen T¹, Kanerva M²

¹Oy Medfiles Ltd, Kuopio, Finland, ²Helsinki University Hospital, Helsinki, Finland

OBJECTIVES: The European Society of Clinical Microbiology and Infectious Diseases (ESCMID) has highlighted recurrence as the most important problem in the management of CDI. There is lack of knowledge regarding length of stay (LOS) and cost associated with recurrent *Clostridium difficile* infection (CDI). Our objective was to collect real life data for estimating days of hospitalization and costs attributable to recurrent CDI. **METHODS:** A prospective observational study was conducted at Helsinki University Central hospital during February 2007 and May 2008. The CDI patients were identified from the microbiology laboratory reports to one of the six acute wards included in the study. Only health care associated CDI cases were included. The recurrence of CDI was defined as a new positive sample less than eight weeks after the first one. The patients had no previous history of CDI one month prior to first positive sample. Resource use data were extracted from the medical records using Appropriateness Evaluation Protocol-based methodology. Unit costs were obtained from literature, hospital administration, laboratory and pharmacy. **RESULTS:** During the 16 months study period, 72 CDI patients were identified, which corresponds to incidence of 0.7-3.8/1,000 patient days. Of those, 7% were recurrent cases (5 patients). Mean LOS for recurrent cases was 3.17 times longer than among non-recurrent cases. The mean incremental cost for recurrent CDI was €6,800 which was 2.52 times higher than the average incremental cost of the total CDI population (€2,700, and €2,300 for not recurrent cases). Most of the resource use came from additional treatment days (94% of total cost). Other costs were due to laboratory tests, medication and isolation. **CONCLUSIONS:** Recurrent CDI is associated with significantly longer LOS and higher costs compared to the average CDI population. The main cost driver between the groups was length of stay.

PIN30

VARICELLA, A COST OF ILLNESS HUNGARIAN STUDY

Tóth E¹, Érsek K²

¹Healthware Consulting Ltd., Budapest, Hungary, ²Corvinus University of Budapest, Budapest, Hungary

OBJECTIVES: Varicella (chickenpox) is one of the most common illness of children, most typical for the 2-6 years age group. In 2.5% of healthy children complications occur (bacterial overinfection, meningitis, meningoencephalitis, pneumonia are the most frequent complications), the infection is potentially life-threatening among healthy and might be directly life-threatening among immunocompromised patients. Varicella can be prevented by live attenuated vaccine. According to WHO recommendation these vaccines are safe, effective and should be implemented into the recommended age-related vaccines. International guidelines recommend the vaccine, although it is not part of the obligatory vaccination schedule in Hungary, nor is covered by reimbursement. **METHODS:** In our research we aimed to examine the consequences of varicella. We calculated the disease of burden in Hungary by the utilization of evidences from literature, health care provision data of Hungarian National Health Insurance Fund Administration as well as questionnaire survey. **RESULTS:** Direct and indirect costs of varicella-related health care provision are significant according to our analysis based on HNHIFA data and questionnaire survey. Our results showed that annually almost 1 billion HUF expendi-

ture caused by varicella. **CONCLUSIONS:** Our analysis determines the disease burden of varicella and emphasizes the importance of prevention. Increasing the rate of vaccination, epidemics can be held up, majority of the serious and complicated cases can be avoided, thus their provisional cost consequence can be decreased. From the societal viewpoint the costs that can be saved by vaccination are even higher as remarkable reduction can be achieved in indirect costs due to the rare, less serious and shorter duration breakthrough cases.

PIN31

BURDEN OF DISEASE AND ECONOMIC IMPACT OF DENGUE AND SEVERE DENGUE IN COLOMBIA: 2011

Castañeda-Orjuela CA¹, Diaz H², Camargo G², Olarte F², De la Hoz-Restrepo F¹

¹Universidad Nacional de Colombia, Bogota, NA, Colombia, ²Universidad Nacional de Colombia, Bogota, Bogota, Colombia

OBJECTIVES: About 50 million dengue infections occur every year worldwide. New dengue vaccines are currently in development and policymakers need appropriate economic studies to determine their potential impact. This study aims to assess the burden of dengue disease in Colombia and its costs. **METHODS:** We estimated the disease burden of dengue (D) and severe dengue (SD) in Colombia for 2011-2014 based on a dynamic model designed with the best available evidence and validated with the occurrence data. The annual number of D and SD cases receiving medical care were determined. We calculated the average cost of care per patient with D and SD based on a bottom-up costing of cases attended in the Colombian health facilities, additional costs were estimated from programs of vector control dengue at different administrative levels. Based on the occurrence of disease and extrapolation of national vector control programs we estimated a total annual cost of burden of dengue in Colombia. **RESULTS:** Our dengue model estimated in 2011 34,751 D consults (13,900 outpatients, 20,851 inpatients), 988 SD cases, and 102 (78-123) deaths due to dengue. In 2012 22,247 D (8899 in- 13,348 out-patients), 863 SD, and 103 (79-124) deaths. In 2013 27,588 D (11,035 in- 16,553 out-patients), 1032 SD and 105 (80-126) deaths. Finally in 2014 25,957 D (10,383 in- 15,574 out-patients), 913 SD, and 106 (80-127) deaths. The total attention costs in 2011 raised to US\$ 16.86 million. That year the total cost of Dengue's vector program amounted to US\$ 37.08-42.41 million. The total annual cost of dengue would amount to US\$ 53.94-59.27 million in a year without outbreak. **CONCLUSIONS:** Burden of dengue disease in Colombia involves a high economic impact to the health system. In 2011 between 28.4-31.3% correspond to medical attention cost and between 68.7-71.6% are due to dengue vector control program.

PIN32

ECONOMIC EVALUATION OF BOCEPREVIR FOR THE TREATMENT OF PATIENTS WITH GENOTYPE 1 CHRONIC HEPATITIS C VIRUS INFECTION IN HUNGARY

Odhiambo R¹, Chhatwal J², Ferrante SA³, El Khoury A⁴, Elbasha E⁵

¹MSD Pharma Hungary Kft., Budapest, Hungary, ²University of Pittsburgh, Pittsburgh, PA, USA,

³Merck Sharp and Dohme Corp., Whitehouse Station, NJ, USA, ⁴Merck Sharp and Dohme,

Whitehouse Station, NJ, USA, ⁵Merck Sharp & Dohme Corp., Upper Gwynedd, PA, USA

OBJECTIVES: Recent randomized, placebo-controlled clinical trials (SPRINT-2; RESPOND-2) demonstrated that the triple combination of peginterferon (PEG), ribavirin (RBV) and boceprevir (BOC) was more efficacious than standard therapy of PEG-RBV alone in treatment of patients with genotype 1 chronic hepatitis C virus (GI HCV) infection. The objective of this study was to evaluate the cost-effectiveness of triple therapy in both treatment-naïve and treatment-experienced patients in Hungary. **METHODS:** A Markov-model was developed to investigate the long-term clinical benefits and the cost-effectiveness of the triple therapy from the Hungarian payer perspective. Health states within the model were defined using METAVIR fibrosis scores (F0-F4), decompensated cirrhosis (DC), hepatocellular carcinoma (HCC), liver transplant (LT), and liver-related deaths (LD). Efficacy data was estimated using SPRINT-2 and RESPOND-2 studies, and disease progression rates and utilities used in the model were estimated from published studies. Data on probability of liver-transplantation and cost estimates were based on an analysis of the Hungarian Sick Fund database. Costs and benefits were discounted at 5%. **RESULTS:** Triple therapy is projected to increase the life expectancy by 0.98 and 2.39 years and the quality-adjusted life years (QALY) by 0.59 and 1.13 in comparison with treatment with PEG-RBV in treatment-naïve and treatment-experienced patients, respectively. The corresponding incremental cost-effectiveness ratios were HUF7,747,962 (EUR 26,717) and HUF5,888,240 (EUR20,304) per QALY, respectively. The lifetime incidence of severe liver disease events (DC, HCC, LT, LD) decreased by 41% and 61% in these patient groups in comparison with treatment with PEG-RBV alone. **CONCLUSIONS:** The addition of boceprevir to standard therapy for the treatment of patients with G1 chronic HCV infection in Hungary is cost-effective using a commonly used willingness to pay threshold of HUF8,48 million (3x GDP per capita).

PIN33

CORSAR-STUDY (COST AND RESOURCE UTILISATION STUDY IN ANTIRETROVIRAL TREATED PATIENTS):

Stoll M¹, Kuhlmann A², Hower M³, Heiken H⁴, Gerschmann S¹, Klauke S⁵, Lutz T⁵, Bogner J⁶, Degen O⁷, van Lunzen J⁷, Bachmann C³, Stellbrink H⁸, Schmidt W⁹, Leistner I⁹, Mahlich J¹⁰, Ranneberg B¹¹

¹Medizinische Hochschule Hannover, Hannover, Germany, ²Leibniz Universität Hannover,

Hannover, Germany, ³Klinikum Dortmund, Dortmund, Germany, ⁴Private Practice, Hannover,

Germany, ⁵Infektologikum, Frankfurt, Germany, ⁶Universität München, Munich, Germany,

⁷Universität Hamburg, Hamburg, Germany, ⁸CH Study Center, Hamburg, Germany,

⁹Ärzteforum Seestrasse, Berlin, Germany, ¹⁰Janssen-Cilag GmbH, Neuss, Nordrhein-Westfa,

Germany, ¹¹Janssen Cilag, Neuss, Germany

OBJECTIVES: Data on actual cost of illness studies for HIV-infection in Germany are lacking. The objective of CORSAR is to collect comprehensively and prospectively

data to calculate direct, indirect and intangible costs in patients receiving ART. **METHODS:** Multicenter prospective observational study in eight German specialized centres for infectious diseases: four private practices/outpatient centres and four hospitals offering inpatient- and outpatient facilities. CORSAR started recruitment during 2009 and ends in July 2012, when the last patient reaches week 96. After signing informed consent, patients were included and stratified by treatment line. Treatment history and concomitant therapy were taken from the patients' records. Direct costs for hospitalization, outpatient care, other medical care and treatment as well as out of pocket payments and quality of life data were calculated from the data collected by quarterly questionnaires. **RESULTS:** A total of 1154 patients with a mean age 47.5y receiving ART were included. Time since HIV-diagnosis was 10.6 years, 10.2% had viral load >50 cp/ml; 10.6% female; employment ratio 60.8%. Direct costs of treatment were mainly driven by antiretroviral drugs, accounting for 83.3%. Due to use of less complex ART-regimens and more frequent use of NNRTI-based ART in earlier treatment lines total costs were highest in advanced treatment-lines (>3rd) with 26,243 €/year compared to 22,718 €/year for initial therapy. The labour market participation rate also decreases with advancement in treatment lines (65% in first treatment line vs. 46% in >3rd treatment lines). Indirect cost due to productivity losses account for 7% of total costs. **CONCLUSIONS:** Total costs were higher in later lines of therapy due to more complex, less NNRTI-based regimens. In comparison to earlier studies the impact of Non-ART-costs decreased. Expenses to be borne by the patient increased but are still less than 1%, indicating an increasing financial burden of people living with HIV by their disease within the German health system.

PIN34

DEVELOPMENT OF TREATMENT COSTS OF PATIENTS UNDERGOING REMISSION INDUCTION CHEMOTHERAPY: A HISTORICAL COMPARISON BEFORE AND AFTER INTRODUCTION OF POSACONAZOLE PROPHYLAXIS

Heimann S, Cornely OA, Wisplinghoff H, Vehreschild MJ, Franke B, Glossmann J, Vehreschild J

University Hospital of Cologne, Köln, Germany

OBJECTIVES: Prior trials have demonstrated efficacy and effectiveness of posaconazole in the prophylaxis of invasive fungal diseases (IFDs) in high-risk patients. Controversy exists about the cost effectiveness of posaconazole prophylaxis in neutropenic patients with a high risk of IFDs. We performed an analysis comparing the direct costs of posaconazole prophylaxis against topical polyene (thrush) prophylaxis in patients with acute myelogenous leukemia (AML) and myelodysplastic syndrome (MDS). **METHODS:** Data of AML/MDS patients receiving remission-induction chemotherapy were analysed to compare hospital costs of patients before (2003-05) and after (2006-08) introduction of posaconazole prophylaxis. All cases were part of an earlier analysis demonstrating effectiveness of posaconazole over topical prophylaxis. Duration on general ward, intensive care unit, mechanical ventilation, diagnostic procedures and all anti-infective drugs were included into the cost analysis. **RESULTS:** Patient groups were well matched according to age, gender, underlying disease, and duration of neutropenia. The average costs per patient in the posaconazole group (n=76) and the topical polyene group (n=81) were 21,040 € (95% CI: 18,204-23,876 €) and 23,169 € (95% CI: 19,402-26,937 €) per patient, respectively. Antifungal treatment costs were nominally higher in the posaconazole group (4,580 € [95% CI: 3,678-5,482 €] vs. 4,019 € [95% CI: 2,825-5,214 €]). Costs for antibacterials (1,316 € [95% CI: 1,039-1,593 €] vs. 1,533 € [95% CI: 1,238-1,827 €]) were numerically decreased in the posaconazole group. Average duration of ICU stays were 1.79 (95% CI: 0.68-2.90) days per patient compared to 3.83 (95% CI: 1.53-6.13) days per patient. Costs for diagnostic procedures were 611 € (95% CI: 478-744 €) and 653 € (95% CI: 552-754 €) per patient, respectively. **CONCLUSIONS:** In our hospital, there was a trend towards cost-saving by posaconazole prophylaxis in patients receiving remission-induction chemotherapy. These cost savings were primarily caused by a shorter overall length of stay and the less frequent ICU treatment of patients receiving posaconazole.

PIN35

COST OF ANTIMICROBIAL PRESCRIBING USING A LARGE PHARMACY DATABASE IN SOUTH AFRICA

Truter I

Nelson Mandela Metropolitan University, Port Elizabeth, Eastern Cape, South Africa

OBJECTIVES: To provide a general overview of antimicrobial prescribing cost in a South African primary care patient population whose prescriptions were dispensed by community pharmacies. **METHODS:** A retrospective, cross-sectional pharmacoepidemiological study was conducted on prescription data of a national community pharmacy group in South Africa for 2010. All records for antimicrobials were analysed. The MIMS classification system was used. **RESULTS:** A total of 660 500 patients received 1 576 593 antimicrobial products during 2010 (average of 2.39 products per year) at a total cost of R191 875 007. The average age of patients was 34.23 years. Most patients were females (58.32%), and they were prescribed 60.12% of antimicrobial products. The average cost per antimicrobial product was R121.70 (SD=R158.21). Antiviral agents were the most expensive (R195.67), followed by aminoglycosides (R188.42). The least expensive products were chloramphenicols (R17.25) and sulphonamides and combinations (R22.68). Beta-lactams were the most often prescribed class accounting for 36.02% of all antimicrobial prescriptions. The average cost for a beta-lactam prescription was R99.53. The average cost per over-the-counter product was R32.75, compared to R158.21 for prescription-only antimicrobials. Most products were tablets (61.80%), followed by capsules (16.25%) and suspensions (14.39%). Per prescription, the injections were the most expensive (average of R343.85 per prescription), followed by ampoules (R324.56) and solutions (R267.33). Creams were on average the least expensive (R31.24).

There was a clear peak in prescribing during the winter months (May to August). The single most often prescribed trade name product was a generic combination product of amoxicillin and clavulanic acid. On average, the most expensive trade name product was Valcyte 450R tablets (valganciclovir) at R12 217.76. **CONCLUSIONS:** This study provided a general overview of antimicrobial prescribing cost in a South African primary care patient population. Costs varied hugely with generic prescribing influencing costs.

PIN36

SIX YEARS OBSERVATIONAL STUDY OF THE COST OF HIGHLY ACTIVE ANTIRETROVIRAL THERAPY AND HIV/AIDS CONTROL

Dimitrova M¹, Savova A¹, Manova M¹, Mitov K², Stefanova M¹, Petrova G³

¹Medical University Sofia, Faculty of Pharmacy, Sofia, Bulgaria, ²Medical University Sofia, Faculty of Pharmacy, Sofia, Sofia, Bulgaria, ³Medical University, Faculty of Pharmacy, Sofia, Bulgaria

OBJECTIVES: To analyze the changes in the highly active antiretroviral pharmacotherapy during the period 2006-2011 and its impact on cost and disease control of HIV/AIDS patients in Bulgaria. **METHODS:** It is a combined retrospective and prospective observational real life study on cost and therapeutic results of AIDS patient's therapy. Information was gathered for 2/3 of the treated patients for the antiretroviral combinations therapy and its cost, CD4 count and viral load. The changes in the dosage regimes, cost of therapy and its influence on CD4 count and viral load were evaluated. Descriptive statistic, Wilcoxon tests, and Spearman correlation analysis were applied. **RESULTS:** On total 162 patients were included and out of them 48 identified with the changes in their therapy. Nearly 40 different dosage regimes were found prescribed as combinations of 3 or 4 medicines. During the period were introduced 3 new antiretroviral medicines (tenofovir, emtricitabine, darunavir). The average yearly cost of pharmacotherapy is increasing from 155 837.64 euro to 319 571.76 euro during 2006 - 2011. To all treatment naive patients were prescribed the newly authorized medicines that lead to sustained suppression of viral load to <20 in 45.46%. Introduction of the new medicines led to the increase in total pharmacotherapy cost with 291 89.64 euro, but also to better disease control. Statistically significant were the changes in the mean cost of therapy in 2007 vs 2006 (p=0,0002) and in 2010 vs 2009 (p< 0,0001). We found the statistically significant changes among the mean cost of therapy and viral load (p=0,0221), as well as among the mean cost of therapy and CD4 count (p=0,05). The correlation among the therapeutic results and the therapeutic combinations were found in 2011 (p=0,0064). **CONCLUSIONS:** AIDS remain costly disease for the health insurance budget but new medicines led to better control on its progression.

PIN37

THE ECONOMIC BURDEN OF INITIAL EMPIRIC ANTIBIOTIC FAILURE ON HEALTH CARE RESOURCE UTILIZATION FOR HOSPITALIZED PATIENTS WITH COMPLICATED INTRA-ABDOMINAL INFECTIONS (CIAIS) IN GREECE

Athanasakis K¹, Petrakis I², Tsoulas C², Vatopoulos A¹

¹National School of Public Health, Athens, Greece, ²Pfizer Hellas, Athens, Greece

OBJECTIVES: To estimate the impact of initial empiric antibiotic treatment failure on pharmacological and total health care costs in hospitalized patients with CIAIS. **METHODS:** The economic impact associated with initial empiric antibiotic treatment failure was based on the results of an observational epidemiological study involving 201 adults with cIAI in Greece (NCT00929643). An average per patient-per day DRG value was estimated based on diagnosis at discharge and DRG mapping. Daily cost was then extrapolated to the additional length of stay (LOS), associated with initial antibiotic failure. Costs included expenditure for additional ICU and surgical interventions. DRG matching was validated by a specialist medical advisor. Mean per patient DRGs were weighed against subject percentage in each diagnosis group. Mean per patient costs for unsuccessful initial therapies were calculated using the latest formulary prices and the mean number of days on each antibiotic agent, as recorded in the observational study. **RESULTS:** The most frequently reported diagnoses (201 subjects) were perforation of the intestine (15.9%), acute appendicitis with peritoneal abscess (13.4%) and post-operative peritonitis (13.4%). Patients most commonly received metronidazole (59.2%), followed by b-lactamase inhibitors (38.3%) and second generation cephalosporines (30.3%) as empiric antibiotic treatment (as part of monotherapy, double therapy or triple therapy schemes). 78 patients exhibited failure of the initial treatment, whereas initial treatment was successful in 111 subjects with respective hospitalization of 21.9±16.4 and 8.9 ± 4.5 days. Total additional per patient resource cost was estimated to be €3,761.56 inclusive of unsuccessful mean empiric antibiotic expenditure, which was estimated to be €220.06 per patient. **CONCLUSIONS:** Retrospective data collected for a 2-year period showed that a significant percentage (42.9%) of patients exhibited failure of their initial antibiotic treatment. These patients had a greater chance of requiring prolongation of hospitalization and more extensive use of health care expenditure during times where resources are scarce.

PIN38

REAL LIFE STUDY OF ANTIFUNGAL TREATMENT IN GREEK ICUS: THERAPEUTIC STRATEGY AND HOSPITAL RESOURCE UTILIZATION - ESTIMATOR STUDY

Armaganidis A¹, Nanas S², Antoniadou E³, Mandragos K⁴, Liakou K⁵, Kostagiolas L⁶, Koutsoukou A⁷, Baltopoulos G⁸, Nakos G⁹, Magkina A¹⁰, Katsaris G¹¹, Prekates A¹², Kompoti M¹³, Georgopoulos D¹⁴, Pneumatikos I¹⁵, Zakynthinos E¹⁶

¹Second Critical Care Department, Attiko University Hospital, University of Athens Medical School, Athens, Greece, ²1st Critical Care Department, Evangelismos Hospital, University of Athens, Athens, Greece, ³Intensive Care Unit, G. Gennimatas General Hospital, Thessaloniki, Greece, ⁴Intensive Care Unit, "Korgialenio Benakio" Red Cross Hospital of Athens, Athens, Greece, ⁵Medical Department, Astellas, Athens, Greece, ⁶Health Data Specialists Ltd, Athens, Greece, ⁷Intensive Care Unit, 1st Department of Respiratory Diseases, Sotiria Chest Hospital, University of Athens Medical School, Athens, Greece, ⁸Athens University School of Nursing, ICU at Ag.