PHP20

REAL-WORLD UTILIZATION PATTERN OF BIOLOGICS IN RHEUMATOID ARTHRITIS: A POPULATION-BASED STUDY

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OBJECTIVES: In November 2011, Center for Drug Evaluation completed the project which aimed to re-evaluate the currently reimbursed biologics for rheumatoid arthritis (RA), and to establish the evidence-based revision rules of reimbursed items covered by National Health Insurance (NHI). As part of this project, this study analyzed the NHI claim data to capture the utilization and prescription pattern of reimbursed biologics in adult patients. METHODS: Identity-encrypted claims data, including inpatient, ambulatory care and contracted pharmacies prescriptions, during 2001 to 2010 were utilized. All records with etanercept, adalimumab and rituximab were included in the first step. Then the records were further separated into hospital and ambulatory care, according to the reimbursement codes. Moreover, the RA patients who were newly treated with biologics were enrolled to assess long-term prescription pattern. We performed both Kaplan-Meier analyses to assess biologics switching over time and medication possession rates to evaluate medication compliance. RESULTS: The expenditure of biologics for RA patients increased rapidly in the past decade and came to NT$ 1.37 billion in 2010. Among 5,142 patients treated by biologics in 2010, 88% received etanercept or adalimumab, and 12% received rituximab. In prescription pattern analysis, rituximab was not reported due to lack of long-term data (reimbursed for RA since November 2008). A total of 3,928 and 1,508 patients initiated by etanercept and adalimumab were analyzed, separately. About 34% of etanercept subjects appeared switching over 85 months and 27% of adalimumab subjects applied second biologics over 45 months. The mean durations of continuous prescription were 29 months and 34 months, respectively. The inpatient outpatient prescription rates were 76% and 93%, respectively. CONCLUSIONS: Under current reimbursement rules, the persistence and compliance of biologic for RA patients were satisfactory. However, the increasing numbers of patients and biological alternatives might intensify the financial pressure on NHI.

PHP21

DOES NATIONAL ESSENTIAL MEDICINE SYSTEM IMPROVE RATIONAL DRUG USE IN PRIMARY HEALTH CARE FACILITIES? AN EMPIRICAL STUDY IN RURAL CHINA

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OBJECTIVES: To examine the effect of National Essential Medicine System (NEMS) on rational drug use (RDU) in primary health care facilities in rural China and to provide reflections and policy implications for currently implemented new health care reform. METHODS: Data was obtained from 151 township hospitals in four provinces by means of field survey (stratified random sampling) conducted between 2010–2011. Indicators of RDU were compared before and after NEMS, and discussed in regard to WHO Standard Guidelines or data from other researches. RESULTS: Under NEMS, average number of drugs per encounter decreased from 3.64 to 3.46 (p < 0.01). Little effect was found in the average number of antibiotics per encounter, but the percentage of encounters with antibiotics prescribed decreased from 60.26% to 58.48% (p < 0.01). The percentage of encounters with injection prescribed and the percentage of encounters with hormone prescribed also decreased and the percentage of oral prescription was 40.31% and 11.16%, respectively. But unfortunately, all the above values remained higher than WHO international standards. The percentage of drugs prescribed from National Essential Drug List increased from 63.33% to 79.89% (p < 0.01). The average expenses per encounter increased from RMB 26.27 to 28.46, and the average pill counts were 433 and 401, significantly than UC group (29 and 27, respectively). Although IMC group have made more visits and switched medications, overall pill counts were 433 and 401, significantly than UC group (29 and 27, respectively). CONCLUSIONS: The implementation of NEMS has greatly improved rational drug use in primary health care facilities in rural China. But the over-prescription of antibiotics and injections and polypharmacy remain common. Treatment guidelines should be established and closely adhered to. Continuing medical education on RDU for both health workers and the public as well as intensive support supervision are the essential actions taken.

PHP22

OFF-LABEL USE OF INTRAVENOUS NON-STEROIDAL ANTI-INFLAMMATORY DRUGS-KETOROLAC IN A NATIONALLY REPRESENTATIVE POPULATION

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OBJECTIVES: Emerging evidence has linked non-steroidal anti-inflammatory drugs (NSAIDs) to cardiovascular adverse outcomes. Specifically, parenteral NSAIDs such as ketorolac are associated with higher risk of adverse outcomes than oral administration. Recent policy concern has therefore focused on the rational use of parenteral NSAIDs. Using 2000-2009 Taiwan’s National Health Insurance research database (NHIRD), the objective of this study was to provide an estimate of off-label use of ketorolac in a nationally representative sample. METHODS: Inpatient (n=303,733) and outpatients (n=605,750) prescriptions of parenteral ketorolac from 2000 to 2009 were identified from a random sample of 1,000,000 individuals in NHIRD in 2005. Ketorolac prescribing outside the indications approved by the Taiwan Food and Drug Administration (i.e. short term use for ≤ 5 days for postoperative pain) was defined as off-label use. Differences in inpatient and outpatient characteristics between licensed and off-label prescriptions were assessed with chi-square tests for categorical variables and t-tests for continuous variables. RESULTS: Off-label use of ketorolac was estimated to be 28.5% at the inpatient settings. The off-label use was more frequent at the outpatient settings (50% of the outpatient prescriptions), with the highest proportion of off-label use among pediatric patients (<6 years old) (97.2%, 6-18 y/o: 95.8%, 18-65 y/o: 95.1%, and >65 y/o: 94.7%). Approximately 50% of the outpatient off-label prescriptions of ketorolac came from metropolitan hospitals. Also, the majority of the outpatient off-label prescriptions of ketorolac were prescribed by the emergency departments. CONCLUSIONS: Our results suggest that the actual extent of off-label use of ketorolac could be very high, especially at the outpatient settings. It highlights the need for a better understanding of the reasons behind this phenomenon, a more appropriate definition of the role of ketorolac in pain management, and a more efficient policy intervention to rationalize the use of ketorolac.

PHP23

DOES COMBINATION PHARMACOLOGICAL INTERVENTION FOR SMOKING CESSATION PREVENT POST-CESSATION WEIGHT GAIN?

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OBJECTIVES: A systematic review was conducted to summarize if combination pharmacological therapy for smoking cessation offers an effective way to reduce post-cessation weight gain. METHODS: Online electronic databases and Medline, Pubmed, PsycoINFO, CENTRAL and EMBASE. Detailed inclusion and exclusion criteria were specified a priori before conducting abstract and full text screening. Included studies were required to: 1) report data on combination pharmacotherapy including at least one FDA-approved smoking cessation medication, 2) outcome measure of weight change, 3) incorporate a minimum of 2-week follow-up, and 4) recruit adult smokers. Studies were excluded if they had 1) behavioral interventions; 2) sample size < 30, 3) switching medications; or 4) they were not written in English. Abstracts and the full texts were reviewed independently by two investigators. Inclusion of studies was decided by a third independent investigator in case of disagreement between the two primary investigators. RESULTS: Out of 1873 citations identified, a total of 1083 citations were included for abstract screening. Finally 33 studies met the eligibility criteria after full text screening of 82 citations. Seven studies showed that the combined therapy group had less post-cessation weight gain than those in the group of individual drugs or placebo. Four studies did not report differential weight gain measures by treatment groups, another study only reported the results of F-tests among treatment groups, and smoking cessation groups without reporting pre-post average weight change. Only one study showed that post-treatment weight gain in the combined therapy group was more than the monotherapy group, although the result was not statistically significant. CONCLUSIONS: Seven out of thirteen studies indicated that combination smoking cessation medications had less post-cessation weight gain than monotherapy or placebo in short term. Long term weight gain was not well documented by most of the studies and is subjected to future research.

PHP24

ASSESSMENT OF THE IN EXCESS NHI-COVERED MEDICATIONS OF OUTPATIENTS IN A 2000-BED MEDICAL CENTER IN TAIWAN

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OBJECTIVES: To evaluate the extent of excess NHI-covered medications in China Medical University Hospital (CMUH), as the surrogate indicator of inappropriate prescribing and medication practices. METHODS: Those patients who have visited outpatient units in CMUH for 50% of all outpatient visits were assigned as CMUH loyal patients by Bureau of NHI. They have received Integrated Medical Care (IMC) services in CMUH since December 2009. Patients who have visited outpatient units in CMUH, including those in IMC services, were encouraged to recycle their excess prescription medications to the Department of Pharmacy and learn about rational medication use. RESULTS: A total of 44,694 patients (∼110,000 NTD) were identified in the first step. Then the records were further separated including inpatient, ambulatory care and contracted pharmacies prescriptions, from the Bureau of NHI. The differences during implementation period between IMC service group and usual care (UC) group were compared using Chi-square test and t-tests. RESULTS: While 32 patients in IMC group and 15 in the UC group recycled their excess medications, more patients in the IMC group had coronary artery disease (p = 0.03). Although IMC group have made more outpatient visits significantly than UC group (29±4 vs 29±3, p = 0.04), their inpatient visits in CMUH were similar. The average pill counts were 433 ±119 versus 223±60 (p = 0.03) and cost of excess prescription medication were 2,219±607 versus 2,126±950 NTD in IMC and UC group, respectively. While HTN, DM and hyperlipidemia were the three major diseases in both groups, those agents for cardiovascular disease and DM accounted for 39% and 15% of all estimated cost of excess medication. CONCLUSIONS: With the substantial excess, NHI-covered medications for chronic illness among CMUH outpatients, it is necessary to come up with workable strategies to enhance appropriate prescribing and medication use in outpatient units.

PHP25

RESEARCH ANALYSIS OF ANTIBIOTICS CONSUMPTION IN NORTHERN PART OF IRAN DURING 2001-2010

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OBJECTIVES: Iran’s Rational Drug Use Committee (RUD) reported that antibiotics’ consumption rate has been in the past decade and they were among the first five most used drugs. Irrational use of antibiotics can cause microbial resistance and move a huge part of the government financial support, this research looks forward to study about the antibiotic consumption’s in Northern states which have around 10% of the whole Iran’s population and comparing them with Iran’s total
consumption to find any significant difference. METHODS: A total of 161 antibiotics are in Iran’s drugs list. According to Iran’s FDO regulations all pharmaceutical companies should submit their sales statistics to this organization each month. Sales amount could be derived from this database state by state. According to WHO method, each drug ATC and DDD code have been derived. DID index (Defined daily dose /1000 Inhabitants/ Day) have been calculated according to the population of each state. RESULTS: Estimated consumption trends of antibiotic in Northern states and Iran have been reported respectively as following: In oral antibiotics, four classes have significant ascending trend: Betalactams (0.715 vs. 0.693), Cephalosporins (0.99 vs. 0.989), Macrolides (0.911 vs. 0.949), Quinolones (0.809 vs. 0.943). In parenteral antibiotics two classes have significant ascending trend: Imipenem (0.967 vs. 0.979), Macrolides (0.951 vs. 0.95). For these two classes we have observed significant ascending trend in comparison to Croatia, as the neighboring country, and Denmark, chosen for its rational policy factors. This study shows that the overall utilization of antibiotics, four classes have significant ascending trend: Betalactams (0.715 vs. 0.693), Cephalosporines (0.99 vs. 0.989), Macrolides (0.911 vs. 0.949), Quinolones (0.809 vs. 0.943). CONCLUSIONS: Most trends were ascending and same as the pattern of whole countries. These results approve the theory of the priority in training programs to clinicians and people according to RUD’s goals in Northern states’ same as other parts of country.

PHP26
CONSUMPTION OF ANTIDIABETICS IN SERBIA IN 2010: A COMPARISON WITH CROATIA AND DENMARK
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OBJECTIVES: Considering diabetes as a major public health problem worldwide, the aim of our study was to analyze overall volume of use of antidiabetics, compared to Croatia, as the neighboring country, and Denmark, chosen for its rational and conservative prescription practice. METHODS: Data for consumption of anti-diabetics in Serbia (ATC group A10) in 2010 were obtained by a retrospective, national, population-based study. Utilization of these drugs was expressed as DDD per 1000 inhabitants a day (DDD). RESULTS: In 2010, antidiabetics (A10) were used at a similar rate in Serbia, Croatia and Denmark (47.34 DDD, 49.88 DDD and 47.50 DDD, respectively), but the share of utilization of insulins (A10A) and oral antidiabetics (A10B) differed between countries. Relatively high proportion of insulin use in Denmark (36.2% of all antidiabetics) compared to Serbia (22.0%) and Croatia (26.4%) may be attributed to high incidence of type 1 diabetes in Nordic countries and compliance with most of recent pharmacotherapeutic guidelines that suggest the use of long-acting insulins (A10A0). In type 2 diabetes (A10B0) in Denmark, Croatia and Serbia, sulfonylureas were used predominantly (55.6% and 46.8, respectively). New medicinal products with effect on the incretin system (A10B1H and A10B1X) were used at a rate of 4.1 DDD in Denmark, contrary to 0.45 DDD in Croatia and 0.02 DDD in Serbia. CONCLUSIONS: The large differences in utilization of various antidiabetics between observed countries suggest considerable variations in habits, especially with regard to type 2 diabetes treatment.

PHP27
THE EFFECT OF RETIREMENT ON MENTAL HEALTH
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OBJECTIVES: To explore the effect of retirement on retiree’s mental health, this study investigated the change in the usage of sedative-hypnotic drugs after the retirement for sedative-hypnotic users. METHODS: We conducted a retroemophic cohort study with comparison groups through following a population-based random sample containing one million beneficiaries of Taiwan’s National Health Insurance from 1999 to 2009. Individuals retired between 2000 and 2003 and aged between 50 and 64 were first identified. Those taking sedative-hypnotic drugs at least one year before and six years after retirement were selected as the study sample, and were further stratified into high-dosage and low-dosage users based on their daily dosage (DDDs). A propensity score (PS) matching was conducted to select two non-retiree control groups with respect to sedative-hypnotic dosage. Each non-retiree was assigned a pseudo retirement date, the same retirement date as his/her matching retiree counterpart. Nonparametric Wilcoxon tests were conducted to compare the differences in DDDs between the retiree and control groups. Generally, the odds ratios (ORs) of drug usage between the retiree and control groups. RESULTS: 9,687 retired sedative-hypnotic users were identified. After PS matching, the number of high-dosage users in both retiree and control groups was 3,365, and the number of low-dosage users was 1,072. The Wilcoxon tests revealed a significant difference in DDDs between the retirees and non-retirees before and after their retirement. The GEE analyses however showed that, compared to their non-retirement counterparts, the low-dosage retired users significantly reduced the dosage of after their retirement (OR = 0.97, p < 0.05). A similar trend was observed in the high-dosage users but no significance. CONCLUSIONS: The decrease in the dependence on sedative-hypnotic drugs after their retirements for low-dosage users might suggest the retirement had a positive influence on mental health.

PHP28
SYSTEMATIC REVIEW ON FACTORS AFFECTING PHARMACEUTICAL EXPENDITURES
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OBJECTIVES: To systematically identify the main factors that contribute towards the growth of pharmaceutical expenditures. METHODS: A systematic search of published studies was conducted in common major electronic databases using search terms “factors'', “financing '', “pharmaceutical'', and “expenditures''. To be included the studies need to 1) measure at least one of the following outcomes: total growth in pharmaceutical expenditures, price growth trend, drug expenditures 2) A clear method to analyze the impact of factors affecting the increases of drug expenditures was mentioned. 3) were written in English. Non-primary articles that were published only as abstract, review, commentary and letter were excluded. Data were extracted from the primary eligible studies using data abstraction form. Information regarding study title, study author(s), country, year, study objective, study design, statistical methods to assess factors affecting pharmaceutical expenditures, results, and author(s) conclusions were collected. RESULTS: From a total of 2039 studies, only 20 studies were included for full review. The most significant determinants or factors of drug spending are demographic, disease category, public health, price, utilization, therapeutic choice, and residual –product mix. A number of studies from the review indicate that residual –product mix responsible for between approximately 30 per cent to approximately 493 per cent of total increases drug expenditures. CONCLUSIONS: Price change has little effect on expenditure increases accounted with residual –product mix. Among the residual –product mix factors need to be considered for optimum drug policy design. It is most important for policy makers to understand pharmaceutical spending trends, the factor influencing the rising of the limited resources and the main cost containment strategies.

PHP29
CONSIDERABLE DIFFERENCES IN THE UTILIZATION OF ANTIDEPRESSANTS BETWEEN SERBIA AND DENMARK
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OBJECTIVES: Depressive disorder is one of the major public health problems due to significant disability that it causes, as well difficulties in diagnostic procedures. The aim of the study was to determine the total antidepressant utilization in Serbia in correlation with Denmark and to get insight into financial resources allocations. METHODS: Data for antidepressant (ATC group N06) utilization and consumption of financial resources in 2010 were retrieved from the annual reports of relevant public institutions. The ATC/DDD methodology was applied and results were expressed in defined daily doses (DDDs) per 1000 inhabitants per day (DDD). RESULTS: An interesting result of our study is that the utilization of antidepressants in 2010 appeared to be 7-fold higher in Denmark (83.8 DID) than in our country (11.67 DID). In accordance with these results, the consumption of financial resources for group N06 was approximately 9-fold higher in Denmark (89.680.072 USD) than in Serbia (10.261.963 USD). The most commonly used group of antidepressants in both countries were selective serotonin reuptake inhibitors (SSRIs) (67.3% and 73.6% of all antidepressants in Denmark and Serbia respectively), but the share of utilization of insulins (A10A) and oral antidiabetics (A10B) was similar rate in Serbia, Croatia and Denmark (47.34 DID, 49.88 DID and 47.50 DID, 191 DDD). PROPORTIONS OF ORS (O.97, p<0.05). A similar trend was observed in the high-dosage users but no significance. CONCLUSIONS: The decrease in the dependence on sedative-hypnotic drugs after their retirement had a positive influence on mental health.

PHP30
THE UTILIZATION AND EXPENDITURE OF REIMBURSED DIGESTIVE ENZYME AGENTS IN TAIWAN
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OBJECTIVES: To analyze the current utilization and expenditure of reimbursed digestive enzyme agents (DEs) in Taiwan. METHODS: The encrypted claim database of National Health Insurance (NHI) was used to analyze the prescription patterns and the expenditure of DEs for types of diseases, health care specialties, levels of medical institution, and insured BNHI branch. RESULTS: We identified that 29 DEs, within 15 groupings, are reimbursed by NHI up to 2011. Given that most DEs were developed in earlier stage, while only 2 items were approved by the Taiwan Food and Drug Administration after 2000, these approved items had broadened indications of approved indications and clinical evidence on their clinical efficacy. According to the analysis of 2001-2010 NHI databases, the most enzymes prescribed disease was gastroenteritis, related uncomfortable symptoms, and so forth. Over the ten years, the number of medical orders increased from 22.77 million to 164.25 million. Medical orders in tertiary hospitals increased from NT$ 1 hundred million to over NT$ 2 hundred million. The highest usage rate of medical orders, by insured to over NT$ 2 hundred million. The highest usage rate of medical orders, by insured BNHI branch. CONCLUSIONS: The differences between insured countries in antidepressant utilization might influence the financial resources are partly consequential to different socioeconomic and health policy factors. This study shows that the overall utilization of antidepressants in Serbia is lower than in Denmark, which implies possible underdiagnosing of affective disorders in general practice.