

95% CI 1.49-2.25) and high disease severity (HR = 6.42, 95% CI 5.07-8.13) groups had increased risk compared to the low disease severity reference group. When both eligibility and disease severity were considered simultaneously, the risk increased for both relapses and hospitalizations as disease severity increased. The eligibility types, however, did not appear to have a clear pattern across MS risk groups for either MS relapse or hospitalizations. **Conclusions:** Among MS patients, an algorithm-determined disease severity categorization appears consistent with relapses and hospitalizations, traditional claims-based measures of disease severity.

PND58

RISK OF ACETYLCHOLINESTERASE INHIBITOR - ASSOCIATED ANTIMUSCARINIC PRESCRIBING CASCADE AMONG OLDER ADULTS WITH DEMENTIA: A NESTED CASE-CONTROL STUDY

Masurkar P,¹ Chatterjee S,¹ Sherer JT,² Aparasu R¹

¹Pharmaceutical Health Outcomes and Policy, College of Pharmacy, University of Houston, Houston, TX, USA, ²College of Pharmacy, University of Houston, Houston, TX, USA

Objectives: Limited national data exists regarding the extent of prescribing cascade of antimuscarinics due to the use of acetylcholinesterase inhibitors (AChEIs) in dementia. This study examined prescribing cascade involving antimuscarinics to treat AChEI-associated urinary incontinence in older dementia patients. **Methods:** A nested case-control study was conducted using 2005-2018 TriNetX Electronic Medical Records (EMR), a federated global electronic network, involving AChEI users. The base cohort included patients aged ≥ 65 years with dementia, no use of AChEI, and no antimuscarinic use between January - June 2005. Cases were dementia patients who initiated antimuscarinic treatment between July 2005 and December 2018. Each case was matched on age (± 5 year) and sex to 3 controls using incidence density sampling. The event date for cases was defined as the date of first antimuscarinic prescription. Incident prescription of AChEIs within 6 months before the event date formed the primary exposure. Conditional logistic regression model stratified on matched case-control sets was performed to evaluate the association between incident AChEI use and antimuscarinic prescribing cascade after controlling for several risk factors. **Results:** The study identified 5,534 cases and 16,585 controls. Cases were significantly more likely to have incident AChEI exposure within 6 months preceding the event date, compared to controls (5.15% vs 0.30 %; p-value <.0001). After controlling for other risk factors, conditional logistic regression analyses revealed that incident AChEI use was associated with 16 times higher odds of antimuscarinic prescribing cascade, compared to non-use (OR =16.49; 95% CI, 11.97-22.71). Other risk factors significantly associated with antimuscarinic prescribing cascade were history of COPD, depression, obesity, other neurological disorders, solid tumor, valvular diseases and use of antipsychotics. **Conclusions:** Incident AChEI exposure was strongly associated with prescribing cascade of antimuscarinics in older dementia patients. Future studies are needed to evaluate the consequences of prescribing cascade associated with AChEI treatment in this vulnerable population.

PND59

ASSOCIATION BETWEEN PARKINSONISM AND THE USE OF GASTROINTESTINAL PROKINETICS: A CASE-CROSSOVER STUDY

Suh HS,¹ Kim E,¹ Kim S,² Han S³

¹Pusan National University, Busan, Korea, Republic of (South), ²Pusan National University, Busan, South Korea, ³Pusan National University, Busan, 48, Korea, Republic of (South)

Objectives: To assess an increased risk of parkinsonism associated with the use of gastrointestinal (GI) prokinetics **Methods:** This case-crossover study was conducted using nationally representative data, the National Health Insurance Service-National Sample Cohort, that covered approximately one million patients from January 1, 2002 to December 12, 2015. We included patients who were newly diagnosed with parkinsonism (ICD-10 G20, G21.1, G25.1) from January 1, 2007 to December 1, 2015 and the first date of diagnosis was defined as the index date. Patients with extrapyramidal and movement disorders or brain tumor within 5 years before the index date were excluded. The exposure to GI prokinetics was self-compared during the risk period (1-30 days) and control period (61-90 days) before or on the index date. We estimated adjusted odds ratios (aOR) of parkinsonism with conditional logistic regression. **Results:** Among 5842 patients with parkinsonism (55.7% women; mean [SD] age, 59.9 [19.8] years), 4632 patients were exposed to GI prokinetics (58.7% women; 61.7 [19.2] years) for the 2 years before or on the index date. 2268 and 1674 patients were exposed to GI prokinetics during the risk period and control period, respectively. The use of GI prokinetics significantly increased the risk of parkinsonism (aOR=2.31; 95% CI, 2.06-2.59). Elderly patients (65 years old) with GI prokinetics were associated with the risk of parkinsonism (aOR=2.69; 95% CI, 2.30-3.14). However, relatively lower risk was observed in younger patients (aOR=1.90; 95% CI, 1.59-2.27). GI prokinetics were prescribed more frequently in internal medicine (32.20% among all medical specialties) and primary care facility (41.31% among all medical institutions) in 1980 patients with GI prokinetics during the risk period. **Conclusions:** The use of GI prokinetics was significantly associated with an elevated risk of parkinsonism. The higher risk of parkinsonism was found in elderly. Deliberate consideration is needed when using GI prokinetics.

PND60

ACETYLCHOLINESTERASE INHIBITOR - ASSOCIATED ANTIPSYCHOTIC PRESCRIBING CASCADE AMONG OLDER ADULTS WITH DEMENTIA

Masurkar P,¹ Chatterjee S,¹ Sherer JT,² Aparasu R¹

¹Pharmaceutical Health Outcomes and Policy, College of Pharmacy, University of Houston, Houston, TX, USA, ²College of Pharmacy, University of Houston, Houston, TX, USA

Objectives: Acetylcholinesterase inhibitors (AChEIs) offer modest effect size for managing dementia symptoms; this may lead to exacerbation including behavioral and psychological symptoms of dementia (BPSD) thereby necessitating treatment with antipsychotics. This study evaluated the extent of prescribing cascade involving AChEIs and antipsychotics in older dementia patients. **Methods:** Using 2005-2018 TriNetX Electronic Medical Records (EMR), a nested case-control study was conducted in a cohort of AChEI users. The base cohort included patients aged ≥ 65 years with dementia, no use of AChEIs and antipsychotics between January - June 2005. Cases were those who initiated treatment with antipsychotics between July 2005 - December 2018. Incidence density sampling was used to match each case with 4 controls based on age and sex. Date of the first antipsychotic prescription formed the event date for cases. Primary exposure was incident prescription of AChEIs within 6 months before the event date. Conditional logistic regression model was used to evaluate the association between AChEI use and antipsychotic prescribing cascade after controlling for other risk factors. **Results:** There were 16,413 cases and 65,609 matched controls. Cases were significantly more likely than controls to have incident AChEI exposure within 6 months preceding the event date (7.39% vs 0.43 %; p-value <.0001). Multivariable analyses revealed that incident AChEI exposure was significantly associated with higher odds of antipsychotic prescribing cascade, compared to non-use (OR =69.74; 95% CI, 54.48 - 89.28). Depression (OR =1.13; 95% CI, 1.08 - 1.18), falls (OR =1.23; 95% CI, 1.15 - 1.30), psychoses (OR =2.88; 95% CI, 2.66 - 3.12), fluid and electrolyte disorders (OR =1.25; 95% CI, 1.19 - 1.31) and other neurological disorders (OR =1.08; 95% CI, 1.01 - 1.16) were significantly associated with antipsychotic cascade. **Conclusions:** The finding of strong association between AChEI initiation and antipsychotic cascade suggests the need to focus on studying the impact of these cascades in the vulnerable dementia patients.

PND61

TIME COURSE OF PRECURSOR NON-COGNITIVE CONDITIONS 5 YEARS PRIOR TO ALZHEIMER'S DISEASE DEMENTIA DIAGNOSIS

Abbass IM,¹ DeClue R,² Choi D,¹ Seleri S,¹ Ruble M,² van Amerongen D,³ Wallick C,¹ Suehs B²

¹Genentech, Inc., South San Francisco, CA, USA, ²Humana Inc., Louisville, KY, USA, ³Humana of Ohio, Cincinnati, OH, USA

Objectives: Alzheimer's disease (AD) is part of a continuum, starting with brain pathology in cognitively normal individuals, followed by an extended prodromal period characterized by a progressive decline in cognitive function. Most research characterizing comorbidities preceding AD-dementia diagnosis focuses on cognitive conditions and is generally limited to the 2 years pre-diagnosis. In this analysis, we investigate trends in the prevalence of non-cognitive conditions over the 5-year period prior to AD-dementia diagnosis. **Methods:** Individuals enrolled in a Medicare Advantage Prescription Drug plan and newly diagnosed with AD-dementia between 01/01/2012 and 06/30/2018 were identified and matched on pre-cohort entry characteristics to clinically similar individuals who did not develop AD or a related dementia. Non-cognitive conditions were defined using the AHRQ CCS condition categories. Annual prevalence of non-cognitive conditions in AD dementia and non-AD cohorts was determined for each of the 5 years pre-diagnosis and the overall pre-diagnosis period, and the prevalence ratio (PR) was calculated. **Results:** In total, 27,308 individuals were matched and included in each group. Cerebrovascular diseases, falls, syncope, acute renal failure, and injuries had the greatest PR during the pre-diagnosis period. PR of these conditions increased over each year during the 5-year pre-diagnosis period. Conditions with the greatest PR during the year immediately prior to diagnosis of AD were: cerebrovascular conditions (7.4); acute cerebrovascular disease (4.8); falls (4.0); transient cerebral ischemia (3.9); syncope (3.5); acute and unspecified renal failure (2.9); open wounds of head, neck, or trunk (2.7); and other injuries and conditions due to external causes (2.7). **Conclusions:** This study documented non-cognitive conditions preceding AD-dementia diagnosis, notably cerebrovascular diseases, injuries, and kidney (renal) failure. This work seeks to inform understanding of the non-cognitive conditions preceding AD-dementia diagnosis and identify early signals that can be used to build predictive models and guide early diagnosis and intervention.

PND63

EPIDEMIOLOGICAL DISEASE BURDEN OF SLEEP APNOEA BASED ON ROUTINELY COLLECTED HEALTH INSURANCE CLAIMS DATA

Boncz L,¹ Endrei D,¹ Pónusz R,² Horváth L,¹ Németh N,¹ Elmer D,¹ Csákvári T,³ Péter I,⁴ Kajos L,¹ Sebestyén A¹

¹University of Pécs, Pécs, Hungary, ²University of Pécs, Pécs, BA, Hungary, ³University of Pécs, Zalaegerszeg, Hungary, ⁴Zsigmond Vilmos Harkány Rehabilitation Centre, Harkány, Hungary

Objectives: Inadequate sleep quality has a considerable impact on quality of life resulting in problems at work and private life as well. Traffic accidents associated with sleep apnoea have become an area of utmost concern. The aim of our study was to determine the epidemiological disease burden of sleep apnoea. **Methods:** Data were derived from the financial database of the Hungarian National Health Insurance Fund Administration (NHIFA), for the year 2018. Data analysed included annual patient numbers, case numbers and prevalence of care utilisation per 100,000 population according to age groups and sex. The following health insurance treatment categories were included into our study: general practice care, home care, in- and outpatient care, medical imaging, laboratory diagnostics, drugs and medical aids. Patients with sleep apnoea were identified with the following code of the International Classification of Diseases 10th revision: G4730. **Results:** The highest national patient numbers were in outpatient care: 13,752 men and 5,204 women in total 18,956 patients, followed by general practice care (6,321 men and 2,496 women, in total 8,817), and case numbers associated with the utilisation of medical aids (5,964 men, 1,535 women, in total 7,499). Based on patient numbers in outpatient care, prevalence in 100,000 among men was 294.4 patients, among women 101.9 patients, in total 193.9 patients. As regards sex distribution in outpatient care 72.5% of patients were men and 27.5% were women, while in the case of medical aids utilisation 79.5% were men and 20.5% were women. **Conclusions:** Prevalence of sleep apnoea was found to be 2.9 times higher among men than among women. Special attention should be paid to male drivers.

PND64

PATTERNS OF PHARMACOLOGICAL TREATMENT OF PATIENTS WITH MIGRAINE, TENSION-TYPE HEADACHE, AND CLUSTER HEADACHE IN COLOMBIA, 2019

Machado-Alba JE, **Gaviria-Mendoza A**, Machado-Duque M
Audifarma S.A. Universidad Tecnológica de Pereira, Pereira, Colombia

Objectives: Headache disorders are a frequent reason for consultation. Migraine, tension-type headache, and cluster headache cause a significant burden of morbidity and disability. The objective was to determine the pharmacological treatment patterns of these kinds of headaches in a Colombian population. **Methods:** Cross-sectional study. The dispensations of drugs for the management of tension-type headache, migraine, and cluster headache in the first trimester of 2019 were reviewed from a national medication dispensing database. Sociodemographic, diagnostic, and treatment variables (acute or prophylactic; concomitant drugs) were analyzed. **Results:** During the study period, 7450 patients were identified: 68.5% with migraine, 25.1% with tension-type headache, and 6.4% with cluster headache. A total of 79.7% (n=5937) were women, and the mean age was 38.6±14.7 years. A total of 87.8% (n=6539) were prescribed drugs for acute pain management, mainly nonsteroidal anti-inflammatory drugs (n=3559; 47.8%), acetaminophen (n=3390; 45.5%), ergotamine (n=2158; 29.0%), and opioids (n=1750; 23.5%). The 50.3% (n = 3750) received at least one drug used for prophylaxis, mainly antidepressants (n=1769, 23.7%), flunarizine (n=927; 12.4%), and β -blockers (n=764; 10.3%). The main comedication was proton pump inhibitors (n=921; 12.4%). **Conclusions:** Patients with tension-type headache, migraine, and cluster headache receive mainly medications for acute management, some with low therapeutic value or not recommended, such as opioids or ergotamine. Prophylactic management is mainly directed to migraines, although patients with other kinds of headache also used it, even though it was not indicated.

PND65

EPIDEMIOLOGICAL DISEASE BURDEN OF INTRACRANIAL INJURY BASED ON ROUTINELY COLLECTED HEALTH INSURANCE CLAIMS DATA

Kívész Z,¹ Danku N,¹ Molics B,² Gazsó T,¹ Kajos L,¹ Szóts B,¹ Endrei D,¹ Horváth L,¹ Sebestyén A,¹ **Boncz I**¹

¹University of Pécs, Pécs, Hungary, ²University of Pécs, Pécs, BA, Hungary

Objectives: The clinical significance of intracranial injuries is due to their high prevalence and high mortality. The aim of our study was to determine the epidemiological disease burden of intracranial injury. **Methods:** Data were derived from the financial database of the Hungarian National Health Insurance Fund Administration (NHIFA), for the year 2018. Data analysed included annual patient numbers, case numbers and prevalence of care utilisation per 100,000 population according to age groups and sex. The following health insurance treatment categories were included into our study: general practice care, home care, in- and outpatient care, medical imaging, laboratory diagnostics, drugs and medical aids. Patients with intracranial injury were identified with the following code of the International Classification of Diseases 10th revision: S06. **Results:** The highest national patient numbers were in CT diagnostics: 10,019 men and 8,950 women, in total 18,969 patients, followed by outpatient care (7,748 men and 6,461 women, in total 14,209 patients), and general practice care (6,529 men and 5,800 women, in total 12,329). Based on patient numbers requiring hospital care in the acute inpatient care, prevalence in 100,000 among men was 91.9 patients, among women 56.2 patients, in total 73.2. Average age of patients of inpatient care was 51.9 years, there was significant difference (5.0 years) between men (49.9 years) and women (54.9 years). As regards sex distribution in the use of CT diagnostics: 52.8% of patients were men, 47.2% were women, in outpatient care men accounted for 54.5%, women for 45.5% of patients. **Conclusions:** Prevalence of intracranial injury was 1.63-times higher among men than among women. Average age of women was 5.0 years higher than

that of men. High patient numbers are attributable to the fact that in the case of patients with intracranial injury CT is the primary diagnostic method.

Neurological Disorders - Health Policy & Regulatory

PND66

RECENT EVOLUTION OF THE MARKET FOR DISEASE-MODIFYING DRUGS FOR MULTIPLE SCLEROSIS IN CANADA

Badgley D, De Benedetti L, **Bennetts L**
Certara Evidence and Access, Montreal, QC, Canada

Objectives: Multiple sclerosis (MS) is a chronic, progressive neurological disease, which at present cannot be cured. MS rates in Canada are among the highest reported worldwide. Disease-modifying drugs (DMDs) are used to prevent disability and delay disease progression in MS patients. Fourteen DMDs are approved in Canada, of which three (peginterferon beta-1a, ocrelizumab, and cladribine) entered the market since 2015. The objective of this study was to evaluate the Canadian market for DMDs since 2015. **Methods:** Data on retail prescriptions and on drugstore and hospital purchases of DMDs in Canada were obtained from IQVIA. Numbers of prescriptions and purchases (in \$Can) were collected for 12-month periods ending February for the past five years (2015–2019). **Results:** Total purchases of DMDs in Canada increased by 31%, from \$447.8 million in the 12 months ending February 2015 to \$585.0 million in the 12 months ending February 2019; during this period prescription activity increased by 16% (from 224,432 to 260,641). Glatiramer acetate, teriflunomide and dimethyl fumarate dominated the market, increasing from 47% of prescription activity combined in 2015 to 60% in 2019. In terms of purchases, in the 12 months ending February 2019 three oral DMDs were market leaders: dimethyl fumarate (17.4%), followed by fingolimod (16.2%), and teriflunomide (15.6%). Market shares of the three newest DMD entrants in Canada accounted for 7.2% of the value of DMD purchases (totalling \$42.2 million) in the 12 months ending February 2019 but only 2.1% of prescriptions (totalling 5,507 prescriptions), reflecting the higher prices of these new therapies. **Conclusions:** DMDs represent a market of more than \$585 million dollars in Canada. Market growth in terms of purchases compared to prescriptions reflects the strong uptake and higher prices of some of the newer MS therapies.

PND67

COMPARISON OF MULTIPLE SCLEROSIS DRUG PRICES IN SAUDI ARABIA VS. UNITED ARAB OF EMIRATES.

Turkistani F,¹ Bin Sawad A²

¹Taibah University, San Francisco, CA, USA, ²Umm Al-Qura University, Makkah, Saudi Arabia

Objective: This study assessed the difference in patient access and public prices (PP) of multiple sclerosis (MS) disease modifying therapies (DMTs) marketed in Saudi Arabia (SA) vs. United Arab of Emirates (UAE). **Methods:** Cross-sectional study. DMTs regulatory information and PP were derived from Saudi Food and Drug Authority (SFDA) and UAE Ministry of Health and Prevention websites. The PP for each DMT was collected from last updated version available in the websites, accessed June 2018. The defined daily dose (DDD) for adult patients was obtained from FDA approved labels and World Health Organization (WHO) website. The PP/DDD was computed and compared between the two countries. The UAE Dirham (AED) was converted to Saudi Riyal (SR) using the latest exchange rates. Independent t-test was performed. The statistical significance level was set at 0.05. **Results:** As of May 2018, there were 8 DMTs available in SA market and only one DMT (Interferon [IFN] Beta-1a) available in UAE Market. The range of PP/DDD was from SR 70.8 (IFN beta-1a) to SR 288 (Natalizumab) for DMTs available in SA market. The PP/DDD for IFN beta-1a were 1.3, 1.5, and 2.5 (for IFN beta-1a 44 µg/1 ml, IFN beta-1a 30 µg/0.5 ml, and IFN beta-1a 22 µg/1 ml, respectively) times higher in the UAE market compared to SA market. The PP/DDD for IFN beta-1a 44 µg/1 ml, IFN beta-1a 30 µg/0.5 ml, and IFN beta-1a 22 µg/1 ml were SR 141.72, SR 141.72, and SR 70.86 in SA market compared to SR 196.43, SR 223.96, and SR 177.99 in the UAE. The difference was statistically significant (P = 0.016). **Conclusions:** PP/DDD for DMTs was significantly higher in UAE compared to SA. Further studies should be conducted to evaluate the reasons for drug lag and difference in prices between SA and UAE.

PND68

EVOLUTION OF THE CANADIAN MARKET FOR PSYCHOSTIMULANTS FOR ATTENTION DEFICIT HYPERACTIVITY DISORDER

Badgley D, **Bennetts L**
Certara Evidence and Access, Montreal, QC, Canada

Objectives: Attention deficit hyperactivity disorder (ADHD), a neurodevelopmental disorder, affects approximately 5% of children and 4% of adults in Canada. Psychostimulant drugs are used to improve symptoms that cause impairment in ADHD patients. Seven psychostimulant medications are approved in Canada, which include amphetamines (dextroamphetamine sulfate, mixed salts amphetamine, lisdexamfetamine dimesylate) and methylphenidate-based products. The objective of this study was to evaluate the Canadian market for psychostimulant therapies for ADHD over the past five years. **Methods:** Data on retail prescriptions and drugstore and hospital purchases of psychostimulants for ADHD in Canada were obtained from