

costs (\$14,380 vs. \$9,800 respectively, $p < 0.05$). **CONCLUSIONS:** Diabetes patients with consistently high medication adherence to oral medications or having a history of an HbA1c test over a five-year period had lower medical costs and lower inpatient and emergency room costs than their counterparts.

PDB93

CLINICAL CHARACTERISTICS, QUALITY MEASURE ATTAINMENT, AND DIABETES-RELATED HEALTH CARE COSTS IN ELDERLY VERSUS OVERALL PEOPLE LIVING WITH TYPE-2 DIABETES MELLITUS (T2DM) RECEIVING METFORMIN (MET) AND SULFONYLUREA (SU)

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OBJECTIVES: This study examined the demographics, comorbidities, clinical characteristics, and treatments of people with T2DM and an elderly subgroup. Additionally, attainment of quality goals and its correlation with diabetes-related costs were assessed. **METHODS:** Health insurance claims and electronic medical records from 14,532 adults with T2DM (2007-2011) were used to identify a sample receiving MET+SU. The index date was defined as the first dispensing of MET+SU after 6 months of eligibility. Clinical characteristics were assessed during baseline and quality measure attainment, defined as no values above specific thresholds (HbA1c <8%, body mass index [BMI] <30 kg/m², blood pressure [BP] <140/90 mmHg, low-density lipoprotein cholesterol [LDL-C] <100 mg/dL), was evaluated during a 12-month landmark period after the index date. Association between quality measure attainment and diabetes-related costs, calculated after the landmark period, was evaluated using non-parametric bootstrap methods adjusting for imbalance in baseline characteristics between cohorts. **RESULTS:** 2,044 patients (mean age: 67 years; female: 46%), including 1,283 (62.8%) patients ≥65 years, were identified. Baseline comorbidities included cardiovascular disease (all patients: 25.5%; ≥65 years: 33.4%), congestive heart failure (5.9%; 8.1%), hypertension (66.5%; 74.2%), hyperlipidemia (73.9%; 78.1%), and neuropathy (16.0%; 20.2%). Statins and loop and non-loop diuretics were taken by 60.5%, 10.5%, and 21.1% of all patients, and 66.9%, 13.8%, and 24.5% of patients ≥65 years, respectively. The proportions meeting various quality goals were: 82.9% (≥65 years: 88.2%) for HbA1c, 34.4% (42.1%) for BMI, 31.6% (27.7%) for BP, and 68.2% (73.3%) for LDL-C. Quality measure attainment was associated with significantly lower diabetes-related costs per-patient per-year (adjusted mean cost differences: -\$1,445 for HbA1c; -\$1,218 for BMI; -\$2,029 for HbA1c and BMI; -\$2,073 for HbA1c, BMI, and BP; all $P < 0.05$) compared to non-attainment. **CONCLUSIONS:** This study highlights the high incidence of comorbidities and potential financial benefits of attaining T2DM quality outcomes at the population level.

PDB94

BURDEN OF HEALTH RESOURCE UTILIZATION (HRU) AMONG INSULIN PEN USERS WITH TYPE 2 DIABETES MELLITUS

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OBJECTIVES: To characterize type 2 diabetes mellitus (T2DM) patients' newly initiating insulin therapy with an insulin pen and quantify their health resource utilization (HRU). **METHODS:** Adult patients with at least one new claim for an insulin pen between January 2006 and September 2010 were selected from the Truven Health MarketScan Research Databases. Patients required continuous enrollment for 12 months after the index insulin pen claim, with a diagnosis of T2DM and one prescription for an oral antidiabetic drug. Frequency and cost of health care encounters were highlighted. HRU includes inpatient admissions, emergency department and outpatient office visits, outpatient laboratory and radiology services, other outpatient services and outpatient prescriptions. HRU was calculated separately for all-cause and diabetes-related expenditures. **RESULTS:** Nine thousand two hundred and eighty five patients met the study criteria with average age of 58.5 (SD=12.4); 52.9% were male. The Deyo-Charlson comorbidity score for this sample was 2.3 (SD=1.8). Most frequently observed baseline microvascular and macrovascular complications included diabetic neuropathy (14.7%), renal disease (16.2%), and ischemic heart disease (22.9%). Other common comorbidities included hypertension (47.3%) and dyslipidemia (31.5%). Patients frequently continued to fill oral anti-diabetic prescriptions after initiating an insulin pen, most commonly biguanides (46.3%) or sulfonylureas (31.8%). Concomitant medication use was high: most patients (83.9%) used a hypertensive, dyslipidemia (72.7%), anti-depressant (28.7%), or anti-emetic/nausea (9.6%) medication in the year after insulin pen initiation. In the year after insulin pen initiation, all-cause expenditures averaged \$26,193 (SD=\$47,670), of which 15.8% were diabetes-related. Inpatient admissions accounted for 27.3% of total costs. Medication costs were substantial, accounting for 27.6% of total costs; 39.8% of medication costs were diabetes-related. **CONCLUSIONS:** Health expenditures associated specifically with T2DM patients initiating an insulin pen are substantial. Further research is required to explore the relationship of T2DM medication management on overall health resource utilization.

PDB95

EVALUATION OF POLYPHARMACY IN PATIENTS WITH TYPE 2 DIABETES MELLITUS AND ITS ASSOCIATION WITH MEDICATION ADHERENCE AND HEALTH CARE COSTS

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OBJECTIVES: To assess level of polypharmacy in patients with type 2 diabetes mellitus (T2DM) and its association with adherence to oral anti-diabetic drugs (OAD) and health care costs. **METHODS:** The Thomson MarketScan Commercial

and Laboratory Databases 2005-2012 were used to select T2DM patients aged 18-64 with continuous enrollment ≥2 years (the first year as baseline) who used OADs. Prescriptions at baseline year with at least 90 days of cumulative days-of-supply were counted to determine level of polypharmacy according to active ingredient. Patients were categorized into four cohorts: no polypharmacy (≤2 drugs), minor (3-5 drugs), moderate (6-8 drugs), and major (≥9 drugs). Adherence to OADs was evaluated during 12-months follow-up using mean proportion of days covered (PDC). Adjusted association between polypharmacy and adherence (PDC ≥0.8) to OAD and total health care costs were examined using logistic regressions and generalized linear regression models, respectively. **RESULTS:** Of the total sample population (N=13,365), 22.4% had non-polypharmacy, 39.3% had minor, 25.3% had moderate, and 13.0% had major polypharmacy. The polypharmacy cohorts had significantly higher all-cause health care costs (non-polypharmacy: \$7,482; minor: \$9,144; moderate: \$14,465; major: \$25,072; all $p < 0.05$) and adherence to OADs (non-polypharmacy: 42.0%; minor: 63.1%; moderate: 73.9%; major: 78.3%; all $p < 0.05$) during the post-index period compared to non-polypharmacy. Annual incremental costs associated with polypharmacy were \$1,602 (minor), \$5,808 (moderate), and \$13,447 (major) when compared with non-polypharmacy cohort. A higher level of polypharmacy was associated with a higher likelihood of adherence than the non-polypharmacy cohort (minor: OR=2.18, 95% CI=1.99-2.40; moderate: OR=3.58, 95% CI=3.20-3.99; major: OR=4.70, 95% CI=4.07-5.43). **CONCLUSIONS:** Polypharmacy was common and associated with high economic burden among patients with T2DM. The positive association between polypharmacy and adherence to OAD warrants further investigation of the behavioral mechanism.

PDB96

PREVALENCE AND RISK FACTORS OF DIABETIC PERIPHERAL NEUROPATHY IN TYPE 2 DIABETES MELLITUS OUT-PATIENTS

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OBJECTIVES: The primary objective was to assess the prevalence of DPN using Vibration Perception Threshold (VPT) using biothesiometer considered as the gold standard for the diagnosis of DPN. The secondary objectives of the study were to compare the prevalence between Known Diabetics (KD) and Newly Detected Diabetics (NDD), assess the neuropathy prevalence pattern and identify any modifiable risk factors associated with occurrence of DPN among diabetics. **METHODS:** The study was cross-sectional, observational study. Subjects were recruited from Endocrinology clinic of a public tertiary care hospital. Subjects with duration of diabetes (≤6 months) were considered to be NDD. VPT measurements were done to assess neuropathy (cut off ≥20V). Severity of neuropathy was graded into three groups based on VPT score as mild (20-24.99 V), moderate (25-39 V), and severe (>39 V). 791 subjects were included on a random sampling basis which includes 638 KD and 153 NDD. Multivariate analysis was performed for assessing independent risk factors associated. **RESULTS:** The median duration of diabetes was found to be 6 (2 - 12) years. 300 subjects were found to have DPN accounting for 37.9% (95%CI: 34.5-41.4) prevalence. Higher prevalence was observed in KD compared to ND (43.7% Vs 13.7%, $p < 0.001$). The prevalence of mild neuropathy was 10.4%, moderate neuropathy was 18.9%, and severe neuropathy was 8.6%. Regression analysis has shown age ($p = 0.007$), female gender ($p = 0.001$), duration of diabetes ($p = 0.001$), dyslipidemia ($p = 0.008$) and presence of other microvascular complication ($p < 0.001$) to be associated with DPN occurrence among diabetics. **CONCLUSIONS:** This cross-sectional study shows the prevalence of DPN to be 37.9%. Severe neuropathy prevalence was found to be 8.6% who were at the risk of foot ulceration or lower limb amputation. DPN was associated significantly with increasing age, early onset of diabetes, female gender and dyslipidemia.

PDB97

HEALTH CARE COSTS AND CLINICAL OUTCOMES ASSOCIATED WITH RATES OF SULFONYLUREA USE BY PHYSICIANS

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OBJECTIVES: To study the association between rates of sulfonylurea (SU) use at a physician's practice and average health care costs and complication rates among the physician's patients with type 2 diabetes mellitus (T2DM). **METHODS:** We performed a retrospective group-level analysis on a sample of 7,905 patients (214,230 patient-months) insured by Humana, aged 18-64 with an incident T2DM diagnosis between 2007 and 2011. We regressed physician-level monthly complication rates (cardiovascular, lower extremity, ophthalmic, renal, neuropathy, and hypoglycemia) and average health care costs on 3-month-lagged rates of SU use controlling for use of 10 other T2DM therapy classes in each physician's practice, and patient and practice characteristics. Costs were estimated using a generalized linear model with log link to account for common zero costs. **RESULTS:** SU use was associated with increased rates of lower extremity, ophthalmic, and renal complications relative to no drug use ($p < 0.05$). For each complication class, we identified the best performing therapy and estimated the effect of a hypothetical switch in prescribing patterns from 100% use of this class to 100% use of SU, as percentages of the respective average complication rates. Our estimates were: 93% increase in cardiovascular when switching from meglitinides, 133% increase in lower extremity when switching from alpha glucosidase inhibitors (AGI), 433% increase in ophthalmic when switching from amylinomimetics, 47% increase in renal when switching from biguanides, 147% increase in neuropathy when switching from AGIs and 252% increase in hypoglycemic complications when switching from amylinomimetics. Despite SU's association with higher complication rates, the