

OBJECTIVES: Racial disparities in diabetics exist in diabetes control, as well as complications associated with diabetes. Such disparities could lead to difference in likelihood of hospitalization among different races. This study examined the association between patients' race and hospitalization in type 2 diabetes patients newly starting oral antidiabetic therapy. **METHODS:** This was a retrospective cohort study of Medicaid insured patients with type-2 diabetes newly starting oral antidiabetic medication (metformin, sulfonylureas, thiazolidinediones). A cohort of type 2 diabetes patients was identified using ICD-9 code (250.xx) and 1 National Drug Code for antidiabetic medication. Information for demographic factors (race, age of patient, gender of the patient), clinical factors (severity of diabetes, number of comorbidities), medication related factors (number of medications consumed), and access to care (number of diabetes related physician visits) was extracted from the database. Patients' race was categorized as African Americans, Whites and Others. Hospitalization was measured as a categorical dichotomous variable. Patients were followed up for one year after the index date of new medication. Multiple logistic regression for three cohorts was performed to assess the association patients' race and likelihood of hospitalization adjusting for above mentioned factors. **RESULTS:** Among metformin users ($n = 215$), there was no difference in the likelihood of hospitalization between races. Among sulfonylureas users ($n = 1171$), there was no difference in the likelihood of hospitalization between races. Among thiazolidinedione users ($n = 1751$), African Americans were associated with 39% increased likelihood of hospitalization as compared to whites (OR: 1.39, 95% CI: 1.07–1.81). Number of medications and comorbidities were found to be significant predictors in each of the analyses. **CONCLUSION:** Racial differences in hospitalizations among thiazolidinediones users should be investigated to understand other factors that contribute to hospitalization in this group. Avoiding hospitalization among these patients would generate considerable cost savings.

DIABETES—Cost Studies

BUDGET IMPACT ANALYSIS OF PIOGLITAZONE FOR DIABETES IN TAIWAN: A RETROSPECTIVE DATABASE ANALYSIS

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OBJECTIVES: To determine: 1) the utilization and expenditures of pioglitazone after the decision of drug reimbursement, and 2) the addition (adding of pioglitazone to the treatment) or substitution (switching from other anti-diabetic agents to pioglitazone) effect of pioglitazone introduction. **METHODS:** Retrospective database analysis was carried out from the payer's (BNHI) perspective. Overall treatment resource from 5-year BNHI claimed-database of diabetic patients (ICD-9-CM: 250.XX), including OPD and hospitalized data from January 2000 to December 2004, were extracted. However, only pharmaceutical expenditures of anti-diabetic agents were analyzed. Drug prices were BNHI reimbursed prices, and discount rate was not considered. **RESULTS:** Five-year database contains population of 0.92, 0.98, 1.02, 1.05 and 1.14 million people from 2000 to 2004 respectively in Taiwan with diabetes (including type 1 and type 2 DM). In 2002, the expenditure of pioglitazone reimbursed by BNHI was NT\$ 37.2 million (1.02% of total anti-diabetic agents), and it increased significantly in 2003 (NT\$ 231.2 million) and 2004 (NT\$ 359.4 million) but approached saturation at last few

months of 2004. It was assumed that if the anti-diabetic agents were not substituted by pioglitazone, patients would still be using them for one year. The effect of drug substitution in 2002, 2003 and 2004 were NT\$ 14.4 million, 61.4 million and 41.4 million, respectively. The order of substitution by expenditure of pioglitazone was rosiglitazone, acarbose and metformin. Subtracting the substituted expenditure, the reimbursement of pioglitazone only burdened insurer NT\$ 22.8 million, NT\$ 169.7 million and NT\$ 318.0 million in 2002, 2003 and 2004, respectively. The cost effect of adverse drug reactions is difficult to evaluate in the retrospective data analysis. **CONCLUSION:** The financial burden of introducing the new drug to a health insurance program should not consider only the expenditure of the new drug itself. The substitution effect should be deducted in the budget impact analysis.

PDB8

COST-BENEFIT ANALYSIS OF INHALED INSULIN: A CANADIAN PERSPECTIVE

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OBJECTIVES: To conduct a cost-benefit analysis (CBA) for inhaled drug delivery system for insulin (INI). **METHODS:** Previously, we reported the average monthly willingness-to-pay (WTP) for INI from diabetic patient (Cdn\$153.70 ± \$99.90) and general population (Cdn\$68.59 ± \$44.65) perspective in Canada. This study estimates the net benefit and cost-benefit ratio for INH from both patient and general population perspective. The average cost of insulin therapy using subcutaneous insulin injection (SCI) was calculated equal to Cdn\$32.40 per month based on average 40 units daily usage of rapid acting insulin for bolus insulin supplement. The cost of self-injection was approximately Cdn\$8.40. One form of INI is available using powder form of insulin and a liquid inhaler is under development. The average daily cost of inhaled delivery system for insulin is approximately 40% higher than SCI. Using the same price premium ratio we estimated the average monthly cost of INI in Canada equal to Cdn\$45.36 (when being available). The cost of basal insulin and self blood-glucose monitoring was considered equal. **RESULTS:** In the base-case scenario, the net benefit of INI when compared to SCI was Cdn\$90.74 per month from the diabetic patient perspective and Cdn\$5.63 from the general population perspective. The cost-benefit ratio (CBR—calculated as $\frac{\text{Cost}}{\text{WTP}}$) from the patient (0.12) and the general population (0.69) perspective were <1, suggestive of a positive CBR for INI. Extensive sensitivity analysis was performed by changing variables (set apriori) including INI price (+10%, 20%) and daily usage of insulin units (±10%, 20%). Results of the analysis were robust to the changes in variables. **CONCLUSION:** This analysis demonstrated that the benefits of inhaled delivery system for insulin for control of blood glucose levels in diabetic patients are greater than the costs, therefore The rapy provide a positive net benefit from both patient and general population perspective and is a good investment for money.

PDB9

DIRECT AND INDIRECT COSTS AND RESOURCE UTILIZATION ASSOCIATED WITH PHOTOCOAGULATION AND VITRECTOMY PROCEDURES AMONG EMPLOYEES WITH DIABETIC RETINOPATHY

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