RESEARCH POSTER PRESENTATIONS – SESSION V

DISEASE-SPECIFIC STUDIES

DIABETES/ENDOCRINE DISORDERS – Clinical Outcomes Studies

PDB1

COMPARISON OF INSULIN GLARGINE VERSUS NPH INSULIN TREATMENT AMONG PATIENTS WITH TYPE 2 DIABETES BASED ON REVIEW OF CLINICAL TRIAL RESULTS

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OBJECTIVES: Basal insulin therapy is commonly initiated in type 2 diabetes (T2DM) patients with a long-acting insulin, such as insulin glargine or the intermediate-acting insulin, NPH. In this study we evaluated the frequency of hypoglycemia associated with insulin glargine vs. NPH insulin treatment based on clinical trial results. **METHODS:** A systematic search was conducted in PubMed to identify clinical trials (2000-2013) in which the efficacy and safety of insulin glargine and NPH insulin treatments were evaluated among patients with T2DM. The primary outcomes assessed in this review of clinical trial results were the frequencies of symptomatic and nocturnal hypoglycemia during trial periods. Of the 366 abstracts reviewed, 7 were of clinical trials with insulin glargine and NPH insulin treatment arms in which hypoglycemia frequency was reported. **RESULTS:** A total of 1,389 T2DM patients were treated with insulin glargine and 1,132 with NPH insulin. The frequency of symptomatic hypoglycemia was highly variable across the trials, ranging from 35%-96% with insulin glargine and 41%-77% with NPH insulin, as was nocturnal hypoglycemia frequency, which ranged from 13%-31% with insulin glargine and 10%-40% with NPH insulin. Two of the 7 trials reported that the frequency of symptomatic hypoglycemia was significantly less among T2DM patients treated with insulin glargine vs. NPH insulin. Of the 5 trials reporting the frequency of nocturnal hypoglycemia 4 reported it was significantly less among T2DM patients treated with insulin glargine vs. NPH insulin. Differences in the change in HbA1c during trial periods were reported as non-significant in all studies, except for 2 with morning insulin glargine arms. **CONCLUSIONS:** Based on clinical trial results insulin glargine and NPH insulin appear similar in glycemic efficacy, but treatment with insulin glargine may be associated with less symptomatic and nocturnal hypoglycemia than treatment with NPH insulin. Additional studies are needed to confirm these findings.

PDB2

IDENTIFYING FACTORS ASSOCIATED WITH HYPOGLYCEMIA-RELATED HOSPITALIZATION AMONG ELDERLY PATIENTS WITH T2DM IN THE UNITED STATES: A NOVEL APPROACH USING INFLUENTIAL VARIABLE ANALYSIS

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OBJECTIVES: Health care providers managing older patients with type 2 diabetes mellitus (T2DM) face a complex milieu of medical conditions and comorbidities, which increase the risk of unintended treatment consequences. The objective of this study was to understand major factors associated with hypoglycemia-related hospitalizations among adults with T2DM with an emphasis on older patients. **METHODS:** A large claims-based retrospective cohort study in the United States was undertaken on actively registered patients with a diagnosis of T2DM and at least one diabetes treatment prescription, which included an oral or insulin/injectable anti-diabetes therapy. The main outcomes assessed included hypoglycemia-related hospitalization and readmission, frequency of comorbidities, and clinical outcomes. **RESULTS:** Of patients with T2DM with hospitalization records (*n*=887,182), 52.3% were male and 30.7% were aged ≥65 years. At baseline, the proportion of patients taking metformin was 52.4%, insulin 7.3%, and sulfonylurea 26.4%. Among those who experienced a diabetes-related hospitalization, the incidence of hospitalization-related hypoglycemia in patients ≥65 years of age was greater than in patients <65 years of age (0.59 compared to 0.16 per 1000 person years). Using boosted regression tree modeling, age (older vs. younger), sulfonylurea use, insulin use and renal disease were the variables most associated with predicting a hospitalization associated with hypoglycemia. Elderly patients prescribed both insulin and sulfonylurea were most likely to have hypoglycemia-related hospitalizations (odds ratio=4.7; 95% CI 3.7-6.1). **CONCLUSIONS:** Older patients using both insulin and sulfonylurea were the most likely to experience a hypoglycemia-related hospitalization in this study. Age, sulfonylurea use, insulin use, and renal disease were the top four influential variables to be associated with hypoglycemia-related hospitalization, while glucagon-like peptide and dipeptidyl peptidase-4 were less likely to be associated these events. More research is required to quantify the burden of these events given sulfonylurea and insulin are presently seen as a very effective and low cost treatment alternatives.

PDB3

INSULIN OR THIAZOLIDINEDIONE USE AND FRACTURE RISK IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE AND DIABETES MELLITUS

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OBJECTIVES: Tight control of diabetes mellitus (DM) with insulin has the potential to increase hypoglycemic episodes which may result in fall and fracture risk. Moreover, patients with chronic obstructive pulmonary disease (COPD) are at high risk of fractures which may put patients with combination COPD and diabetes are particular risk. Our goal was to compare the risk of fractures associated with insulin use compared to TZDs in patients with COPD and DM. **METHODS:** We conducted a nested case-control study using the IMS LifeLink® Health Plan Claims database, including patients at least 45 years old with a diagnosis of COPD and DM that were new users of either a TZD or insulin. Cases were individuals that experienced a fracture between January 2006 and December 2011. Controls were matched with cases at a 4:1 ratio on the following characteristics: gender, age, geographic region, and date of first dispensing of a TZD or insulin prescription. We conducted conditional logistic regression analyses to estimate the odds ratios (ORs) of having a fracture associated with the use of insulin compared to TZD while controlling for other covariates. **RESULTS:** There were 2,842 cases matched to 8,238 controls. The mean (standard deviation) age of the study subjects was 46.5 years (0.9) and 57.6% were women. Among cases, 32.8% used insulin and 67.2% used TZDs, and for controls 30.3% used insulin and 69.7% used TZDs. The crude OR for insulin users compared with TZD was 1.14 (95% confidence interval [CI], 1.04-1.25). After adjustment for other antidiabetic drugs, comedication, and comorbidities, the OR was 1.28 (95% CI, 1.09-1.49). **CONCLUSIONS:** We found an association between use of insulin and fractures compared to TZDs in patients with COPD and DM. While further research is needed, clinicians and policy makers should assure that screening guidelines consider this relative risk in patients with COPD and DM.

PDB4

CLINICAL EFFICACY AND SAFETY OF INSULIN ASPART COMPARED WITH REGULAR HUMAN INSULIN IN PATIENTS WITH TYPE 1 AND TYPE 2 DIABETES MELLITUS RECEIVING PRANDIAL INSULIN REGIMEN - A SYSTEMATIC REVIEW AND META-ANALYSIS

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OBJECTIVES: Prandial insulins are a key component in insulin treatment in type 1 diabetes mellitus (T1DM) and many type 2 diabetes mellitus (T2DM) patients. The evidence supporting a choice between available insulin preparations is still limited. We performed a systematic review of clinical data comparing efficacy and safety of insulin aspart (IAsp) and regular human insulin (RHI) in both types of diabetes. **METHODS:** Randomized controlled trials (RCTs) directly comparing IAsp with RHI after ≥12 weeks of treatment in patients with either T1DM or T2DM receiving prandial insulin regimens were retrieved within systematic search of medical databases (MEDLINE, EMBASE, Cochrane's CENTRAL) carried out up to May 2013. Results from individual studies were meta-analyzed and presented as weighted mean difference (WMD) or relative risk (RR). **RESULTS:** Of 16 RCTs considered relevant for the current review, 11 papers referred to T1DM and 5 were representative for T2DM patients. Pooled results for T1DM population demonstrated that IAsp as compared with RHI provided larger reduction of the HbA1c level (9 RCTs; WMD[95%CI]=-0.11% [-0.16, -0.05]) as well as better postprandial glucose level following breakfast (4 RCTs; WMD[95%CI]=-1.40mmol/L [-1.72, -1.07]), lunch (3 RCTs; WMD[95%CI]=-1.01mmol/L [-1.61, -0.41]) and dinner (4 RCTs; WMD[95%CI]=-0.89mmol/L [-1.19, -0.59]). The risk of nocturnal hypoglycemia was lower in T1DM patients treated with IAsp (4 RCTs; RR=0.76 [0.64, 0.91]), while no difference was observed for severe hypoglycemic events. In T2DM patients IAsp lead to a larger HbA1c reduction (5 RCTs; WMD[95%CI]=-0.22% [-0.39, -0.05]) and provided superior postprandial blood glucose control. The risk of hypoglycemia, either overall or severe events was comparable between arms. **CONCLUSIONS:** IAsp provided better glycemic control as compared with RHI in T1DM and T2DM in patients receiving prandial insulin regimen. T1DM patients treated with IAsp were less prone to develop nocturnal hypoglycemia, while both interventions presented comparable risk of severe hypoglycemic events.

PDB5

A SYSTEMATIC LITERATURE REVIEW AND EVIDENCE SYNTHESIS OF ANTI-DIABETES TREATMENTS IN TYPE 2 DIABETES MELLITUS PATIENTS: INDIRECT COMPARISON OF EXENATIDE WITH METFORMIN + SULPHONYLUREA

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OBJECTIVES: To support a German Federal Joint Committee (G-BA) submission, a systematic review and meta-analysis feasibility were conducted to assess the efficacy and safety of the GLP-1 receptor agonist exenatide against pre-defined comparators as required by the G-BA, for the management of patients with Type 2 diabetes mellitus (T2DM). Both the short- (Byetta®) and long-acting (Bydureon®) exenatide formulations were eligible for inclusion. **METHODS:** Database searches (accessed September 2013) were conducted to identify eligible randomised controlled trials (RCTs) that evaluated Byetta®/Bydureon® in one of the G-BA approved indications. In the absence of appropriate head-to-head studies, the feasibility of conducting a robust meta-analysis was assessed for outcomes of interest. **RESULTS:** With regard to Byetta®, single head-to-head RCTs were identified for two G-BA required comparisons: Byetta®+metformin vs metformin+sulphonylurea (SU) and Byetta®+metformin+SU vs insulin+metformin. No head-to-head RCTs were identified that assessed Bydureon® vs G-BA comparators. However, two RCTs were identified which permitted an indirect comparison of Bydureon®+metformin vs metformin + SU via a common treatment (sitagliptin+metformin). Baseline patient characteristics (body weight 81–89 kg; HbA_{1C} 7.5–8.6%; duration of diabetes 5–7 years across treatment arms) and study duration (26-30 weeks) were comparable between trials. Bucher indirect comparison results indicated that treatment with Bydureon®+metformin was associated with a significantly greater reduction in HbA_{1C} (mean difference -0.53% [95% confidence interval (CI): -0.84, -0.22; p=0.001]) and weight (mean difference -3.5kg [95% CI:-4.4, -2.6; p<0.001]) and a significantly lower incidence of minor hypoglycaemia (odds ratio (OR) 0.03 [95% CI: <0.00, 0.17; p<0.001]) compared with metformin+SU. The incidence of adverse events (AEs) (OR 1.06 [95% CI: 0.63, 1.79 p=0.821]) and serious AEs (OR 1.22 [95% CI: 0.26, 5.70; p=0.800]) was similar. **CONCLUSIONS:** Indirect comparison results indicate that in patients with T2DM, treatment with Bydureon®+metformin is associated with significant efficacy benefits and a similar safety profile compared with metformin+SU.