With Type 2 Diabetes

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Diabetic kidney disease (DKD), a devastating complication of diabetes, is one of the leading causes of end stage kidney disease (ESKD). Kidney transplantation provides superior outcomes for ESKD patients with type 2 diabetes, giving opportunities to be free from dialysis, but needs lifetime immunosuppressive medications to avoid graft kidney rejection. Post-transplant hyperglycemia, however, remains to be unsolved, because immunosuppressive agents, including glucocorticoids and calcineurin inhibitors, may result in impaired insulin secretion and sensitivity. Safe and promising anti-diabetic strategy is long-awaited among kidney transplant recipients (KTRs) with type 2 diabetes. Enormous evidence has accumulated that Glucagon-like peptide 1 (GLP-1) receptor agonists have potential to maintain kidney function as well as improve glucose tolerance in patients with DKD. The present study was designed to elucidate the association between GLP-1 receptor agonist use and better graft kidney function in KTRs with type 2 diabetes. Among KTRs with type 2 diabetes between 2012 and 2019, 73 with GLP-1 receptor agonist use and 73 without GLP-1 receptor use were identified in our center. After propensity matching, 50 KTRs were newly initiated with GLP-1 receptor agonist use or other antidiabetic medications. Baseline characteristics were well-balanced in the 2 groups. KTRs with GLP-1 receptor agonist use had greater kidney function 12 months after initiation of GLP-1 receptor agonists, compared to their counterpart KTRs without GLP-1 receptor agonists, according to estimated glomerular filtration ratio (p=0.01). Interestingly, transient decrease of body mass index was observed in KTRs with GLP-1 receptor agonist use during the 12 months. All GLP-1 receptor agonist-initiated KTRs were followed up through December 31, 2019. In conclusion, GLP-1 receptor agonist treatment was associated with better graft kidney function in KTRs with type 2 diabetes. Pharmacological GLP-1 receptor activation showed favorable tolerability and may alleviate graft kidney damage in KTRs with type 2 diabetes.

Diabetes Mellitus and Glucose Metabolism

DIABETES COMPLICATIONS AND COMORBIDITIES

An Open-Access Platform for Translating Diabetes and Cardiometabolic Disease Genetics Into Accessible Knowledge

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Most associations from genome-wide association studies (GWAS) result from as-yet-unknown alterations of molecular or cellular function; the causal variants and effector genes responsible for them, and the tissues and pathways through which they act, remain largely unknown. Thousands of associated loci have now been identified for each common disease and its related traits. In order to translate GWAS data into biological knowledge, they must be integrated with functional genomic annotations reflecting tissue-specific regulation and with the results of bioinformatic methods that predict the functional effects of associations. However, these data types are typically spread across disparate resources, and working with them requires bioinformatic expertise.

To make these results accessible and understandable to the broader diabetes and cardiometabolic disease research communities, we have developed the open-access Common Metabolic Diseases Knowledge Portal (CMDKP; cmdkp.org), which brings together a robust software and data storage platform with a streamlined and intuitive user interface for four disease areas: diabetes (both types 1 and 2); cardiovascular disease; cerebrovascular disease; and sleep and circadian disorders.

The CMDKP enables researchers to access and explore a comprehensive matrix of genetic, genomic, and computational results. It includes 3 classes of genomic data: 1) GWAS summary statistics from the most current and authoritative datasets available, as identified by disease-area experts; 2) functional genomic annotations, such as chromatin accessibility, that reflect the tissue-specific regulatory potential of genomic regions; and 3) the results of bioinformatic methods applied to these aggregated data (for example, overlap-aware meta-analysis to determine "bottom-line" p-values, the GREGOR method for determining tissue-specific enrichment of genetic associations, the MAGMA method for generating gene-level association scores, and more). All of these data types are integrated and accessible via interactive tools that allow researchers to explore and evaluate the data in order to identify candidate disease effector genes for further research. The CMDKP provides researchers with the data and tools necessary to translate genetic associations and functional annotations into knowledge about disease mechanisms and potential therapeutic targets.

Diabetes Mellitus and Glucose Metabolism

DIABETES COMPLICATIONS AND COMORBIDITIES

Association Between Metformin and Prevention of Dementia in T2DM Adult Patients

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Introduction: In 2020 the World Health Organization estimated that the number of people with dementia was 50 million in the world. Furthermore, it is expected about 10 million new cases every year. Alzheimer's disease (AD) is

the most common form of dementia, which represents more than 50% of the cases. Type 2 diabetes mellitus (T2DM) is a major risk factor for AD and dementia. Even in people without clinical dementia, diabetes is associated with decreased cognitive performance and with increased brain atrophy. If comparing general population and people with diabetes, patients with T2DM had a 73% higher risk of developing dementia and a 56% increased risk of developing AD. Typically, the first medication prescribed for T2DM is metformin and it has been associated with the reduction of cognitive decline and the risk of dementia in patients with T2DM when compared with diabetic patients without medication. A randomized, double-blinded, placebo-controlled study demonstrated that during metformin treatment there was an improvement of executive functioning, learning, memory, and attentional abilities. A possible explanations for the protective effect of metformin in patients with T2DM is that it prevents hyperinsulinemia and the formation of amyloid-β plaques in the brain and the onset of AD. Metformin does not only decrease the plasma glucose level in several mechanisms, but it also characterized to beneficially effect serum lipid profiles, reduce inflammatory cell adhesion to endothelium, and exert anti-inflammatory, anti-apoptotic and anti-oxidative properties. **Method:** A Clinical Scientific Research was made about correlation among dementia and metformin. Were searched and found in PubMed a total of 61 articles between 2015–2020, but only free access and those who correlated metformin and dementia were used. **Results:** Studies showed that T2DM patients taking metformin had decreased risk of developing dementia or AD if compared to others diabetic patients that were not taking metformin. However, it is being hard to test antidiabetic therapies in AD, because the mechanisms which tie T2DM to Alzheimer clinical syndrome are not totally known. Therefore, to be as effective as possible it is necessary to treat the patients before they develop extensive amyloid and tau tangle burden. **Conclusion:** Diabetic patients taking metformin have a protector factor to don't develop dementia or AD, when compared to those who don't take metformin since they started the treatment before accumulation of amyloid and tau protein in the brain.

Diabetes Mellitus and Glucose Metabolism

DIABETES COMPLICATIONS AND COMORBIDITIES

Climate Changes' Effect on Blood Pressure in Diabetic Patients

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There has been noted a correlation between atmospheric temperature and some chemical, hematological and homeostatic variables on blood presure. Blood pressures' variation was determined in diabetic patients with no high blood pressure issues living in a region with hot summers of 90–100º F (BP Hot) and cold winters with snow (BP cold). Chihuahua city has such weather conditions. 221 patients were included, 44 were women (20%) and 177 men (80%). The timeline was from May 2016 to January 2019 were all the cardiovascular events were noted. Group I had 89 patients (40.2%), having Diabetes Mellitus for more than 20 years. Average age of the group is 70 years old (60 - 84 years old). The increase in systolic blood pressure (BP) was of 27.5 mmHg (15–30 mmHg) and of the diastolic BP of 10 mmHg. As extra data it was noted that pulse increased 10 beats per minute (bpm). As a clinical presentation, 35 patients (39.3%) patients were found to be in NYHA class I, 27 (30.3%) in class II, and 27 (30.3%) in class III. Dyslipidemia was present in 70 (78.6%) of them, hypertensive cardiomyopathy (per ECG or Echocardiogram) in 37 (41.5%). From this group, 27 (30.3%) were admitted in the ER for uncontrolled blood presure with no symptoms, 45 (50.5%) admitted for high BP with symptoms (headaches, dizzines, epistaxis or conjuctival hemorrhage), 9 (10.1%) were admitted due to heart insuficiency and 4 (4.4%) sudden cardiac death. Group II included 132 patients (59.8%) with less than 20 years with DM and an average age of 64 years old (53–71 years of age). The increase in systolic BP was of 8.5 mmHg (less than 10 mmHg) and diastolic BP of 5.8 mmHg. Heart rate varied by 3.3 bpm (less than 5). Clinical presentacion of NYHA class I were 89 (67.4%) patients, 30 (22.7%) in class II, and 13 (9.8%) in class III. 92 (69.6%) patients presented dyslipidemia, and 30 (22.7%) hypertensive cardiomyopathy. Out of this group, 30 (22.7%) patients were admitted due to high BP without symptoms and 17 (12.8%) were admitted with high BP and symptoms. It is concluded that patients that have been diabetic for a longer time, with greater cardiovascular problems and older in age have a diminished reaction to the body's control mechanisms and react more to the cold weather.

Diabetes Mellitus and Glucose Metabolism

DIABETES COMPLICATIONS AND COMORBIDITIES

Clinical Effectiveness and Safety of Gliclazide MR and Linagliptin Combination in the Management of Patients With T2DM and Chronic Kidney Disease (CKD) Switched From Glimepiride - a Real-World, Retrospective, Observational Study

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Background: Type 2 diabetes (T2DM) patients are at high risk of developing to CKD and progressing to adverse outcomes vs Nondiabetics. The aim was to evaluate the effectiveness and safety of gliclazide MR switched from glimepiride in combination with linagliptin considering their associated potential benefits in albuminuria reduction and delaying progression of adverse renal outcomes in T2DM patients with kidney disease as shown in previous data. **Methodology:** The medical study database of the author's hospital identified T2DM patients with stage 1–3 CKD with mean eGFR of 50.4 ± 8.56 ml/min/1.73 m2 and were inadequately controlled with glimepiride (mean dose 3.24mg) for the last 3 months. These patients were switched to gliclazide MR with appropriate equivalent dose while DPP-4 inhibitors like linagliptin (5 mg OD)