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diabetes was 1.80 (95% CI: 1.51, 2.15; $p < 0.0001$). Conclusion: Compensatory hyperinsulinemia in young adults nearly doubles the risk for diabetes later in life, independent of other risk factors.

Keywords: insulin resistance, hyperinsulinemia, serum insulin, diabetes, risk factors

Abbreviations: CARDIA, Coronary Artery Risk Development in Young Adults Study; CH, compensatory hyperinsulinemia; RG, reference group; ROC, receiver operator characteristic; CI, confidence intervals

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Metabolism Clinical and Experimental 104S (2020) 154132 Correlates and Risk Factors for Compensatory Hyperinsulinemia in U.S. Populations

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Abstract

Background: Compensatory hyperinsulinemia (CH) is an overlooked condition where elevated blood insulin compensates for tissue insulin resistance. Individuals with CH do not meet the clinical criteria for prediabetes or metabolic syndrome. In the U.S., CH is prevalent in teenagers, young adults and Hispanic populations. Moreover, CH in young adults nearly doubles the risk for diabetes later in life. Objective: Identify risk factors for compensatory hyperinsulinemia in U.S. populations. Methods: Both cross-sectional and longitudinal population data were analyzed. Multi-step regression analysis was performed using the 2003–2004 National Health and Examination Survey (NHANES), with fasting insulin as the outcome variable. A machine learning algorithm was used to screen for predictors, followed by principal components analysis with variable clustering to yield the most representative variables. Subsequent multiple linear regression yielded variables independently correlated with fasting insulin. Those variables were incorporated into Cox regression models, using data from the Coronary Artery Risk Development in Young Adults study (CARDIA), to identify risk factors for incident CH.

Results: The independent risk factors for CH included increased waist circumference, poor physical fitness, gender= male, race= Black, increased uric acid (hypoxia), low HDL, increased % globulins (inflammation) and increased hematocrit (hypoxia). By contrast, increased bilirubin (antioxidant) and alcohol intake were protective. Of note, glucose, triglycerides, non-HDL cholesterol, blood pressure and family history of diabetes were not risk factors for CH.

Conclusion: Along with central obesity and poor physical fitness, recurrent hypoxia and inflammation may contribute to the

development of compensatory insulinemia in individuals that were normoglycemic and insulin-sensitive at baseline.

Keywords: insulin resistance, compensatory hyperinsulinemia, serum insulin, diabetes, risk factors

Abbreviations: NHANES, National Health and Nutrition Examination Survey; CARDIA, Coronary Artery Risk Development in Young Adults Study; CH, compensatory hyperinsulinemia; PCA, principal components analysis; HDL, high density lipoprotein cholesterol

Funding and Conflicts of Interest: This work was supported by NIH/NHLBI grant 1R21HL143030 and institutional funds from the Texas Tech Health University Health Science Center El Paso. The authors disclose no pertinent financial relationships or conflicts of interest.

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Metabolism Clinical and Experimental 104S (2020) 154133 Inflammatory, hypoglycemic and antioxidant effect of *Azadirachta Indica* infusion on obesity rats induced by hypercaloric diet

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Universidad de Guadalajara

Abstract

Background: Obesity is a complex, multifactorial disease that has reached epidemic proportions in some parts of the world. Before the development of comorbidities of obesity, there are physiological changes already described, such as oxidative stress, inflammation and insulin resistance. These changes are critical steps for the development of obesity comorbidities.

The objective of this study was to evaluate the Inflammatory, hypoglycemic and antioxidant effect of *Azadirachta Indica* (*A.I*) and Azadirachtin (*A*) in obese rats. **Material & Methods:** Twenty male Wistar rats with a weight of 100 ± 20 gr were used. Obesity was induced in rats by feeding a hypercaloric diet. The compounds administered were: *A.I* (50mg / 1mL) *A* (1820 ppm) *Vehicle* (Tween 80 at 2%). In these groups, glucose, C-peptide, insulin, lipid profile, oxidative stress markers and proinflammatory cytokines were quantified. **Results:** In the groups that received hypercaloric diet the concentration of the different markers were affected, such as glucose, C-peptide, lipid profile and oxidative stress. Treatment with *A.I* showed a significant reduction in carbonylation, while malondialdehyde values remained high independent of the treatment received in the hypercaloric diet groups. After administration of *A.I* or *A* no significant differences were found in the activity of antioxidant enzymes. The lipid profile showed no decrease, in the specific case of triglycerides the values were increased in the groups treated with *A. Indica*. **Conclusions:** *A.I*, demonstrated antioxidant capacity. Both *A.I* and *A* have significant effects on oxidative stress markers, glucose, C-peptide and insulin. *Both* had no lipid lowering effect.

Keywords: Azadirachta Indica, Azadirachtin, Glucose, Oxidative stress

Abbreviations: AI: Azadirachta Indica, A: Azadirachtin

Funding and Conflicts of Interest: The authors declare that there is no conflict of interest.

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Cardiorenal Disease is the Costliest CVD in Type 2 Diabetes: A Large Long-Term Observational Study

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Abstract

Introduction: Cardiorenal disease (heart failure [HF] or chronic kidney disease [CKD]) has recently been shown to be the most common first T2D CVD manifestation, associated with high mortality risks. The aim was to describe the development of cardiorenal- and cardiovascular disease (CVD) health care costs. **Methods:** T2D patients without prior CVD and cardiorenal disease, defined as CVD free, were identified in full-population health care registries in Sweden and indexed 1st January 2007. Mean health care cost per patient was summed cumulatively over 10-years for first and recurring events of: stroke, myocardial infarction (MI), peripheral artery disease (PAD) and cardiorenal disease. **Results:** From 229,033 patients; 137,738 (60%) were CVD free, and followed for mean 7.7 years, 1.1 million patient-years. Cardiorenal disease was the most common CV manifestation (47.7%), followed by stroke (22.7%), MI (19.6%) and PAD (10.0%). HF and CKD were separately 24.0% and 23.7% respectively. In CVD free T2D patients, health care costs for cardiorenal disease was the highest already within the first year. In the total population, CVD costs incurred health care costs of ~\$1 billion (mean \$7008 per patient) of which cardiorenal disease was the costliest (60.5%), followed by stroke (16.8%), MI (13.6%) and PAD (9.1%). HF and CKD were separately 30.5 and 30.0% respectively. **Conclusion:** In CVD free T2D patients, cardiorenal diseases incurred the highest short and long-term health care costs compared to stroke, MI and PAD. These data highlight the total health care burden of cardiorenal complications and the urgent need of preventive efforts.

Keywords: heart failure, chronic kidney disease, health care cost, observational study, type 2 diabetes

Abbreviations: T2D, type 2 diabetes. HF, heart failure. CKD, chronic kidney disease. CVD, cardiovascular disease, MI, myocardial infarction

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A cross sectional study of the prevalence of hypothyroidism in a sample of patients with high risk for diabetes

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Abstract

Background: Recent studies suggested that the chronically high-blood glucose that can be induced by thyroid disease may contribute to the development of pre-diabetic state. **Objective:** The aim of the study was to describe the prevalence of hypothyroidism in a sample of patients with prediabetes. **Methods:** 312 subjects with previous Impair fasting glucose (IFG), evaluated in the outpatient clinic at the Air-force Central Hospital in Lima-Perú, were include. An Oral Glucose Tolerance test (OGTT) were performed to define the pre-diabetic state. Hypothyroidism were considered based on the results of TSH and free thyroxin (Ft4) or previous history of disease. Lipid profile, liver enzymes (AST and ALT) and anthropometrics measurements (body-mass index and abdominal circumferences) were obtained. **Results:** The mean age was 55.9 ± 12.6 , with 173 (55.4%) females. After OGTT we found 26 subjects with type 2 diabetes. The prevalence of prediabetes was 55.5% which represents 173 subjects (98 with IFG and 75 with Impaired Glucose Tolerance [IGT]). We found 113 subjects with normal glucose (NG). The prevalence of hypothyroidism was 11% (36). In the prediabetes group, we found 12.7 % (22) of subjects with hypothyroidism, 14.3% (14) with IFG and 10.7% (8) with IGT. The prevalence of hypothyroidism in subjects with NG was 9.7% (11). There no were significant differences in the prevalence of Hypothyroidism between the group of prediabetes (neither IFG or IGT) and NG. **Conclusion:** In our study, the preliminary analysis did not find significant differences in the prevalence of hypothyroidism between subjects with prediabetes and normal glucose.

Keywords: Prediabetes, hypothyroidism

Funding and Conflicts of Interest: Nothing to disclose.

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Diabetes Knowledge and its relationship with metabolic control and comorbidities in type 2 Diabetes patients

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Abstract

Background: Education in diabetes patients is key in the intervention to avoid complications and develop new and better habits. It is necessary to know the relationship between the current diabetes knowledge of these patients with their metabolic control and the presence of comorbidities. **Objective:** To evaluate the diabetes knowledge and its probable association with their metabolic control and comorbidities in type 2 diabetes patients. **Methods:** A validated questionnaire (Diabetes Knowledge Questionnaire, DKQ) was applied to 134 patients who