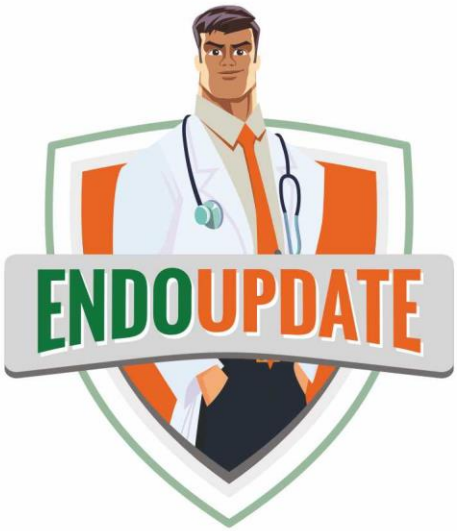
Dr.Reddy's



Endo 2021

March 20-23, 2021

Presenting you daywise 3 days update

DAY 3

DP's Life... Non-stop

For the use of Registered Medical Practitioner or Hospital or Laboratory only.

GGI-CO-Chronic 1-ZE-MVX-300034046-LB-C21-464

Highlights of ENDO 2021

Obesity raises type 2 diabetes risk in women with PCOS

Women with obesity and polycystic ovarian syndrome (PCOS) are at increased risk of developing type 2 diabetes, **according to a study presented virtually at ENDO 2021, the Endocrine Society's annual meeting.** Normal-weight women with PCOS are not at increased risk, the researchers found.

Women with PCOS had a more than three-fold increased risk of developing type 2 diabetes during their lifetime, the study found. This risk was evident only in women who met the criteria for overweight or obesity, but not in lean women.

"We strongly suggest weight management in women with obesity and PCOS in an attempt to reduce this major risk of developing type 2 diabetes," said lead researcher Sarantis Livadas, M.D., Ph.D., of Athens Medical Center in Athens, Greece.

PCOS is a common disorder characterized by irregular menstrual periods, disruption of normal metabolism and excessive hair growth. PCOS affects up to 10% of all women of reproductive age. The disorder can lead to obesity, diabetes and cardiovascular disease, which are often life-long conditions. Between 50%-80% of women with PCOS have obesity, and obesity is known to be a risk factor for diabetes.

The link between PCOS and diabetes has been based on a small number of studies, mostly evaluating women with the condition and obesity.

In the new study, the researchers analyzed 23 previous studies in order to assess the impact of obesity in subsequent type 2 diabetes development in women with PCOS. The studies included a total of 60,336 women with PCOS and 259,444 without the disease. A total of 8,847 women in the studies had type 2 diabetes.

"We conclude that only women with PCOS and obesity have an increased risk for type 2 diabetes development, in contrast to the current notion that all women with PCOS have a significant risk for developing type 2 diabetes," said Livadas. "This finding underscores the impact of early detection of this PCOS population and prompt lifestyle modification to avert the development of type 2 diabetes."

Sugar Is Not Always Sweet: Exploring the Relationship Between Hyperglycemia and COVID-19 in a Predominantly African American Population

Samara Skwiersky, Sabrina Rosengarten, Megan Chang, Alastair Thomson, Talia Meisel, Francesca Macaluso, Brandon Da Silva.

Introduction:

- A relationship between hyperglycemia and outcomes in patients with COVID-19 has been proposed, however there is a paucity of literature on this. In this study, we examined the effect of admission glucose in diabetics and non-diabetics on outcomes in patients hospitalized with COVID-19.
- Our study uniquely examines this association in a largely African American cohort, a population disproportionately affected by COVID-19.

Methods:

- In this retrospective cohort study, we analyzed all adults admitted with COVID-19 to a designated COVID hospital in Brooklyn, NY from March 1 to May 15, 2020. Diabetics were compared to non-diabetics, and were further stratified based on admission glucoses of 140 and 180 mg/dL.
- Diagnosis of diabetes was based on history and/or Hba1c > 6.5%. Univariate, multiple and logistic regressions were used for analyses, examining outcomes of mortality, intubation, ICU admission, acute kidney injury (AKI), and length of stay based on admission glucose levels, while controlling for age, gender, lab values (serum creatinine and WBC), and comorbidities including *hypertension, cardiovascular disease,* and *obesity.*
- Outcomes are presented as an adjusted odds ratio (OR) with 95% confidence interval (95% CI).

Results:

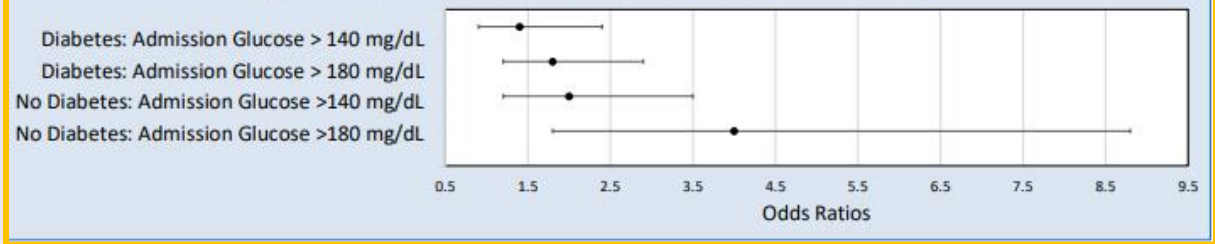
- 708 patients were analyzed; 54% diabetics, 83.5% non-Hispanic Blacks, 51% male with a mean age of 68, BMI of 29 kg/m^2 and crude mortality rate of 40%. The length of hospital stay was greater in diabetics than non-diabetics, (13±26 days vs 9.5±18.5 days, $p<0.05$).
- Diabetics with an admission glucose > 140 mg/dL (vs<140 g/dL) had a 2.4-fold increased odds of both intubation and ICU admission (95% CI: 1.2, 4.5; 1.3, 4.6). Diabetics with admission glucoses > 180 mg/dL (vs <180 g/dL) had a 1.8-fold increased mortality (95% CI: 1.2, 2.9).
- Non-diabetics with admission glucoses >140 mg/dL (vs<140 g/dL) had a two-fold increased mortality (95% CI: 1.2, 3.5), 3.5-fold increased odds of ICU admission (95% CI: 1.8,6.6) and a 2.3-fold increased odds of both intubation and AKI (95% CI: 1.3, 4.2; 1.3,4.2).
- Non-diabetics with a glucose >180 mg/dL (vs <180 g/dL) had a four-fold increased mortality (95% CI: 1.8, 8.8), 2.7-fold increased odds of intubation (95% CI: 1.3, 5.6) and 2.9-fold increased odds of ICU admission (95% CI: 1.3, 6.2).

Table 1. Adjusted odds ratios for the association between admission glucose levels and outcomes in patients with and without diabetes

Predictor	Mortality OR (95% CI)*	p-value	Intubation OR (95% CI)*	p-value	ICU OR (95% CI)*	p-value	AKI OR (95% CI)*	p-value
With Diabetes								
Glucose > 140	1.4 (0.9 – 2.4)	0.15	**2.4** (1.3 – 4.6)	0.006	**2.4** (1.2 – 4.6)	0.01	1.2 (0.8 – 2.0)	0.41
Glucose > 180	**1.8** (1.2 – 2.9)	0.01	1.5 (0.9 – 2.6)	0.12	1.5 (0.8 – 2.5)	0.18	1.2 (0.7 – 1.8)	0.51
Without Diabetes								
Glucose > 140	**2.0** (1.2 – 3.5)	0.01	**2.3** (1.3 – 4.2)	0.005	**3.5** (1.8 – 6.6)	<0.001	**2.3** (1.3 – 4.2)	0.004
Glucose > 180	**4.0** (1.8 – 8.8)	<0.001	**2.7** (1.3 – 5.6)	0.008	**2.9** (1.3 – 6.2)	0.008	2.0 (1.0 – 4.3)	0.07

*adjusted for age, sex, white blood cell count, creatinine, hypertension, cardiovascular disease, chronic kidney disease, and BMI

Figure 2. Adjusted Odds Ratios: Admission Glucose and Inpatient Mortality



- Our results show that hyperglycemia portends worse outcomes in all individuals hospitalized with COVID-19, regardless of prior diagnosis of diabetes. Elevated admitting glucoses >180 mg/dL increased odds of mortality four-fold in non-diabetics and 1.8- fold in diabetics. In COVID-19, diabetic patients had a 37% greater length of hospital stay than non-diabetics.

These findings suggest that patients presenting with hyperglycemia may require closer observation and more aggressive therapies. However, whether hyperglycemia is a marker, or a cause of more severe COVID-19 infection remains unknown. This raises the testable hypothesis that intensive glucose control with frequent glucose monitoring and treatment for a target glucose of < 140 mg/dL could improve outcomes in patients hospitalized with COVID-19.

Hypocalcemia in a 15 Year Old With New Onset Type 2 Diabetes Mellitus

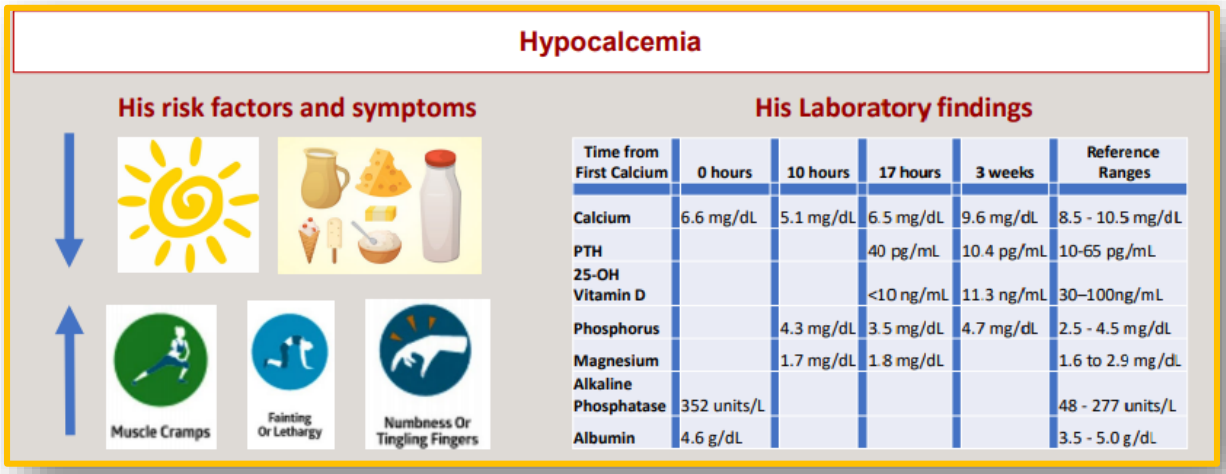
Carlos C. Becerril Romero, Rebecca Schneider Aguirre, Erik Allen Imel, Linda A. DiMeglio, Anisha Gohil.

Background:

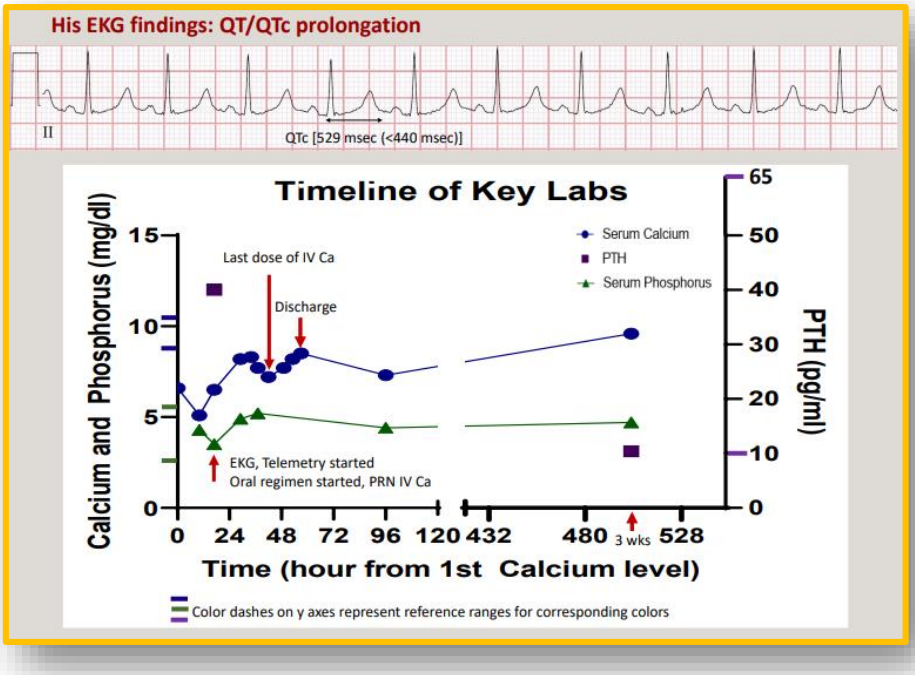
- Diabetic ketoacidosis and significant hyperglycemia are associated with known electrolyte derangements in sodium, potassium, and phosphorus. Hypocalcemia and hypoparathyroidism occurring in uncontrolled diabetes are rare.
- We present a case of new-onset diabetes with severe hypocalcemia.

Case:

- A 15-year-old obese Caucasian male with ADHD and autism presented to the Emergency room due to hyperglycemia found on laboratory evaluation for hypertension. Serum glucose was 563 mg/dL, serum bicarbonate 24 meq/L (21 - 31 meq/L), and HgbA1C 11.4% (4.0 - 5.6%). He was admitted to initiate insulin and for diabetes education.
- On admission, hypocalcemia was noted: serum calcium 6.6 mg/dL (8.5 - 10.5 mg/dL), alkaline phosphatase 352 units/L (48 - 277 units/L), and albumin 4.6 g/dL (3.5 - 5.0 g/dL).
- Repeat testing revealed serum calcium 5.1 mg/dL, phosphorus 4.3 mg/dL (2.5 - 4.5 mg/dL), and magnesium 1.7 mg/dL (1.6 - 2.9 mg/dL). He endorsed a 2 month history of tetany, paresthesia, and muscle weakness.
- Due to food aversions, his dietary intake of calcium and vitamin D was minimal. He had limited sun exposure. Subsequent PTH was 40 pg/mL (10 - 65 pg/mL) with concurrent serum calcium of 6.5 mg/dL. QTc was prolonged [529 msec (<440 msec)], prompting transfer to the intensive care unit for telemetry, intravenous calcium gluconate, and regular calcium monitoring.



- Treatment was commenced with cholecalciferol 2000 international units daily and oral calcium carbonate (50 mg elemental calcium/kg/day) in divided doses for presumed Vitamin D deficiency. After several intravenous calcium gluconate doses over 24 hours, the patient's QTc and ionized calcium normalized.



- At discharge, calcium was 8.5 mg/dL. He was discharged on the above regimen of calcium and cholecalciferol, and basal and bolus insulin. After discharge, laboratory results returned indicating negative diabetes autoantibodies (GAD 65, Insulin, IA-2) and 25-OH Vitamin D <10 ng/mL (30 - 100ng/mL).
- Two days after discharge, calcium was 7.3 mg/dL. Two weeks later, labs were: 25-OH Vitamin D 11.3 ng/mL, PTH 10.4 pg/mL, and calcium 9.6 mg/dL.
- This teen presented with new-onset type 2 diabetes and symptomatic hypocalcemia, an atypical feature of new-onset diabetes. This patient's hypocalcemia was likely due to both vitamin D deficiency and hypoparathyroidism.
- He had a low vitamin D level and poor calcium intake with elevated alkaline phosphatase; however, his high normal serum phosphorus and inappropriately normal PTH (instead of elevated in the setting of severe hypocalcemia) indicated a component of hypoparathyroidism. Calcium normalized with detectable 25-OH Vitamin D levels but PTH remained low.

Our case highlights the importance of recognizing both that electrolyte abnormalities at diabetes onset may not be directly attributable to diabetes/hyperglycemia and that vitamin D deficiency and hypoparathyroidism may co-exist.

To Evaluate the Relationship of Risk Factor Between Diabetes Mellitus and Thyroid Dysfunction (Thyrobetes)

Dr Madhumati Varma, India.

Introduction:

- Type 2 diabetes and thyroid dysfunction are common endocrine disorder and shown mutually influence each other. As per the GOQii is a smart-tech enabled, integrated preventive healthcare platform headquartered in California, diabetes has increased from 7.1 to 12% this year.
- "The incidence of diabetes is highest among older adults at 23.81 per cent and seniors at 36.82 per cent." As per the report, 13.5% of Indians have cholesterol issues. This past year, thyroid issues have increased from 6.8% to 10.7%.
- The thyrobetes illustrates relationship the between thyroid diseases and diabetes mellitus.

Objective:

- This study's objectives are as follows:

  To define the interrelation of factors responsible for the link between diabetes and thyroid disease development;

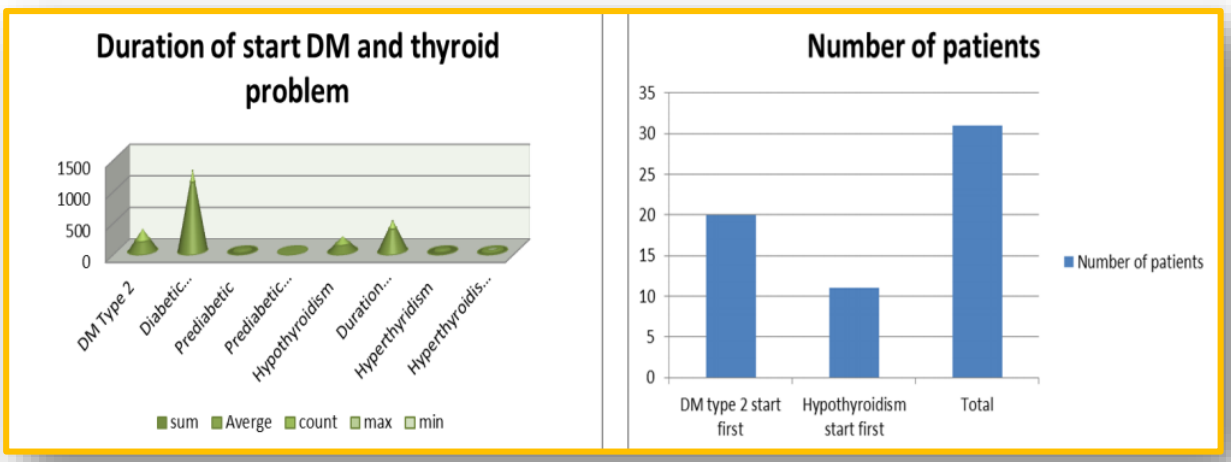
  To estimate thyroid hormone TSH, free T3, free T4, lipid profile, blood glucose fasting and PP, HbA1c, S. Insulin, ant-TPO antibodies, and USG neck for some thyroid patients;

  To describe each factor correlation between developing diabetes and thyroid diseases; and To explain preventive measures for diabetes and thyroid diseases.
- Research problem of the study there are an increasing number of patients who experience diabetes mellitus, hypothyroidism and other types of thyroid dysfunction, but it is difficult to say which disease occurs first.
- This study seeks to identify the overlapping risk factor for diabetes and thyroid dysfunction. Review of literature type 2 diabetes mellitus and thyroid dysfunction (TD) are two major public health endocrine problems. The status of iodine and thyroid with diabetic patients less studied.

Materials and Methods:

- The study included 300 patients of diabetes and thyroid dysfunction. The questionnaires were used to record the findings on thyroid hormone TSH, free T3, free T4, lipid profile, blood glucose fasting and PP, and USG neck for some thyroid patients.

- **Inclusion criteria:** Sample size -300 patients, No limit to the age group, New or follow up cases of diabetic mellitus and thyroid disease.
- **Exclusion criteria:** Patients who had an acute illness that affects thyroid gland activity, Patients who consumed drugs that could influence the thyroid hormone status, Patients who had fever.
- Data collection and tools for statistical analysis, Instruments used for analyzing the samples that are availability at JNU hospital.
- **Statistical Analysis:** Statistical analysis performed by using SPSS software, student 't' tests, and Pearson's correlation; if the P* value < 0.005, then it will considered to be statistically significant.



- Thyroid disease and diabetes are two intertwined conditions. If you have a thyroid condition, you're at an increased risk for developing diabetes, and if you have diabetes, you're at an increased risk for thyroid disease.

Study showed Diabetes Mellitus-2 more frequent than hypothyroidism, compared duration of both diabetes and thyroid diseased patient complex interdependence, found few patients only had both diabetes and hypothyroidism (10.6%) in which out of (36.6%) had thyroid first appeared in patients both most of them single diseases either diabetes or thyroid problem.

Predictors of the Lack of Annual Fasting Blood Sugar Screening in US Adults

Aayush Visaria, Priyanka Raju, Joel James, Karen K. Khangura, Sumaiya Islam, Amir Amanullah, Pooja Polamarasetti.

Background:

- Diabetes mellitus is a major cause of morbidity and mortality. Many individuals remain undiagnosed. The purpose of this study was to identify predictors of the lack of annual fasting blood sugar (FBS) testing in a representative cohort of U.S. adults.

Methods:

- A total of 257,652 adults ≥18 years from the 2011-2018 National Health Interview Surveys (NHIS) were included. Participants were considered to have had FBS testing if they reported a fasting test for diabetes or high blood sugar in the past 12 months.
- Predictors of screening utilization were selected using the Anderson Model for Healthcare Utilization, including predisposing (age, sex, race/ethnicity), enabling (smoking, alcohol consumption, physical activity, insurance status, education, citizenship status, region of residence), need (BMI group, comorbidities, cardiovascular disease [CVD]), and healthcare-related factors (doctor visits, satisfactory care, affordability, delayed care).
- We used diabetes status-stratified multivariable logistic regression with a stepwise selection method to determine the most significant predictors. All analyses accounted for the survey design and weights to obtain nationally representative estimates.

Results:

- Among the 257,652 participants, 115,630 (48%) were male, 27,096 (9.4%) had diabetes, and 141,247 (56%) did not have a FBS test in the past 12 months. Among those with diabetes, 4,529 (16%) did not have a FBS test.
- Positive predictors of a lack of FBS testing included younger age, male sex, non-Hispanic Black race, ever smoker (≥100 cigarettes), native born, lack of insurance coverage, lack of adequate physical activity, northeast region (relative to west region), no known chronic diseases, and dissatisfactory care.
- The top 5 most significant predictors of a lack of FBS test in those without diabetes were, in order, 1) no visits to the doctor in the past 12 months (aOR [95% CI]; 5.64 [5.34, 5.96]), 2) insurance status (no coverage vs. coverage; 1.62 [1.54, 1.69]), 3) age group (Ref: ≥65y; 18-35y: 2.45 [2.34, 2.56]; 35-50y: 1.46 [1.40, 1.52]; 50-65y: 1.04 [1.01, 1.08]), 4) BMI group (Ref: Low/Normal; Overweight: 0.79 [0.77, 0.82]; Obese: 0.62 [0.60, 0.64]), and 5) race/ethnicity (Ref: Non-Hispanic White; Non-Hispanic Black: 1.03 [0.98, 1.07], Asian Indian: 0.65 [0.58, 0.74]; Other Asian: 0.91 [0.83, 1.00]; Hispanic/Multiracial: 0.91 [0.86, 0.96]).

- The top predictors for those with diabetes were similar, although there were significantly greater odds of a lack of FBS testing in Non-Hispanic Blacks vs. Whites (1.24 [1.14, 1.35]).

Table 1. Baseline Characteristics by Race/Ethnicity

Demographic Characteristics	Overall	Non-Hispanic White	Non-Hispanic Black	Asian Indian	Other Asian	Hispanic
Age						
≥65	62,571 (18.9%)	50,266 (21.1%)	7,283 (13.9%)	251 (8.3%)	1,317 (16.4%)	3,454 (10.2%)
Insurance Status						
Covered	222,700 (86.6%)	166,884 (88.5%)	29,821 (83.4%)	2,790 (91.8%)	5,797 (89.9%)	17,408 (73.3%)
Not Covered	34,000 (12.9%)	21,282 (11.2%)	5,354 (15.6%)	251 (8.0%)	668 (9.3%)	6,445 (25.7%)
Health and Health Related Behaviors						
Blood pressure taken in the past 12 months	213,836 (82.3%)	159,369 (83.8%)	29,804 (82.5%)	2,358 (79.4%)	5.064 (78.7%)	17,241 (70.8%)
Blood sugar checked in the past 12 months	116,405 (44.1%)	86,317 (44.7%)	16,074 (42.9%)	1,387 (49.8%)	2,898 (46.3%)	9,729 (39.7%)
Chronic Disease Status						
Self-reported history of hypertension	87,612 (30.6%)	63,599 (30.7%)	15,594 (37.5%)	471 (17.6%)	1,802 (26.4%)	6,146 (22.7%)
Self-reported history of diabetes	27,096 (9.4%)	18,596 (8.9%)	5,112 (12.0%)	229 (8.3%)	539 (7.5%)	2,620 (10.0%)
Self-reported History of Cardiovascular Disease	37,213 (12.7%)	29,407 (13.8%)	5,085 (11.8%)	142 (4.5%)	525 (7.7%)	2,054 (7.4%)
Healthcare Access						
Had doctor's appointment in the past 12 months	209,441 (80.7%)	156, 321 (82.4%)	28,763 (79.3%)	2,289 (76.9%)	5,003 (77.8%)	17,065 (70.3%)
* all p values are <0.0001						

Table 2. Positive Predictors of a lack of FBG testing in the past 12 months

Younger age	
Male sex	Lack of adequate physical activity
non-Hispanic Black (vs. non-Hispanic White)	Northeast Region of Residence (vs. West)
Low/Normal BMI	No known chronic diseases
Ever smoker (≥100 cigarettes)	Dissatisfactory care
Native born (vs. immigrated)	No visits to the doctor in the past 12 months
Lack of insurance coverage	

Table 3. Top 5 Significant Predictors of Lack of FBG Testing in Participants without Diabetes

Predictor	
Visit to doctor in past 12 months	aOR [95% CI]; **0.12 [0.11, 0.13]**
Insurance status	Coverage vs. no coverage; **0.54 [0.48, 0.61]**
Age group	Ref=≥65y; 18-35y: **1.48 [1.26, 1.75]**; 35-50y: **1.16 [1.04, 1.29]**; 50-65y: **0.84 [0.78, 0.91]**
BMI group	Ref=Low/Normal; Overweight: **0.82 [0.74, 0.90]**; Obese: **0.74 [0.67, 0.81]**
Race/ethnicity	Ref=Non-Hispanic White; Non-Hispanic Black: **1.03 [0.98, 1.07]****, Asian Indian: **0.66 [0.43, 1.01]**; Other Asian: **0.74 [0.56, 0.97]**; Hispanic/Multiracial: **0.87 [0.77, 0.99]**

More than half of the participants reported a lack of FBS testing in the past year; among those with diabetes, nearly 1 in 6 reported not having an annual FBS test. This reaffirms the need for long-term patient-physician relationships and aggressive follow-up in younger, male, uninsured, and/or lean individuals with or without diabetes.

Changes in Visceral Fat and Its Correlation With Changes in Metabolic Variables After Bariatric Surgery

Eduardo Doval, SUSANA REYES LOPEZ, Alejandra Albarran, MD, MSc, Ernesto Sosa, MD, MSc, Claudia Ramirez, MD, MSc, Aldo Ferreira, MD, MSc, Etual Espinosa, MD, MSc.

Introduction:

- Obesity is a health problem. There is a relationship between visceral adipose tissue (VAT) and various metabolic components. So far the most effective treatment for weight reduction and control of comorbidities is bariatric surgery.
- After bariatric surgery there is a reduction in VAT and a correlation with better control of metabolic variables would be expected.

Objective:

- To determine the decrease in VAT, calculated by bioimpedance at 3 and 6 months after bariatric surgery and its correlation with changes in metabolic parameters (fasting glucose, HOMA, HbA1c, lipid profile).

Material and Methods:

- Patients belonging to the HECMNSXXI Obesity Clinic undergoing bariatric surgery during 2020 who agreed to participate in the study were included. VAT volume was determined before surgery and at 3 and 6 months after the procedure by bioimpedance using the SECA mBCA525 body analyzer.
- At the same time, biochemical metabolic markers were determined (fasting glucose, HOMA, HbA1c, CT, HDL, LDL, and triglycerides). The results were reported using descriptive statistics. A Pearson or Spearman correlation was carried out according to the distribution of the variables. $P < 0.05$ was taken as significant.

Results:

- Eleven patients with a mean age of 49 ± 7 years were included, 73% of them were women. Their average initial BMI was 42 ± 4 kg/m^2. VAT prior to surgery had a mean of 10.6 ± 2.5L for men and 6.4 ± 2.4L for women.
- Eighty-two percent of the patients fulfilled harmonized criteria for metabolic syndrome. There was a statistically significant decrease in VAT at 3 and 6 months after surgery in both men and women (Baseline 7.5 ± 3L, 3 months 3.8 ± 2.8 L ($p < 0.001$), 6 months 2.5 ± 2 L ($p = 0.001$).
- An average decrease in visceral adipose tissue of 57 ± 24% in women and 34 ± 18% in men ($p = 0.18$) was found 3 months after surgery and 70 ± 22% in women and 60 ± 21% in men ($p = 0.53$) 6 months after surgery.
- Laparoscopic one-anastomosis gastric bypass (OAGB) was the type of surgery with the highest percentage of VAT loss at 3 and 6 months, however, this was not statistically significant when compared with Y-Roux Gastric bypass (YRGB).

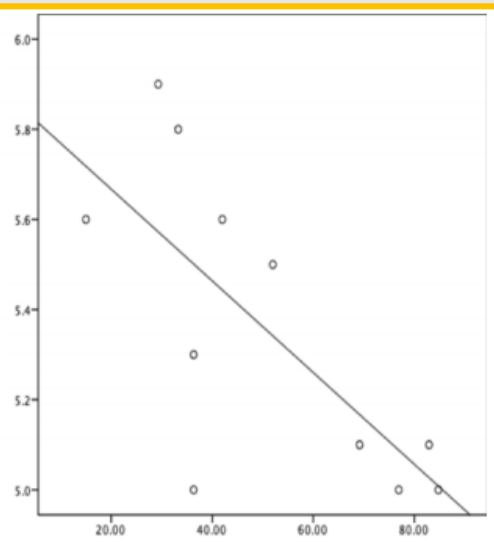
- A statistically significant decrease in HbA1c, HOMA, total cholesterol, LDL, and triglycerides levels were found at 3 and 6 months after surgery.
- However, when correlating the proportion of VAT lost with the metabolic variables, only a significant correlation was found with the HbA1c levels. The higher the proportion of VAT lost, the lower the HbA1c levels (R2 -0.72 p = 0.01).

Parameter	Presurgical	3 months post surgery (n= 11)	p*	6 months post surgery (n=9)	p+
Visceral Adipose Tissue (VAT) L					
Total	7.5 ± 3	3.8 ± 2.8	<0.001	2.5 ± 2.2	0.001
Men	10.6 ± 2.5	6.9 ± 2.8	0.11	4.5 ± 2.9	0.01
Women	6.4 ± 2.4	2.7 ± 1.84	0.004	1.49 ± 1.04	0.01
Metabolic parameters					
Fasting glucose (mg/dl)	94 ± 7	94 ± 26	0.99	85.5 ± 13.5	0.09
HbA1c (%)	5.7 ± 0.27	5.3 ± 0.34	0.03	5.2 ± 0.4	0.01
HOMA	4.2 ± 2.1	2.7 ± 2.1	0.17	2.1 ± 0.8	0.04
Total Cholesterol (mg/dl)	179 ± 44	152 ± 43	<0.001	136 ± 29	<0.001
HDLc (mg/dl)	43 ± 12	41 ± 11	0.58	40 ± 10	0.89
LDLc (mg/dl)	107 ± 42	92 ± 39	0.03	79 ± 28	0.004
Triyglicerides (mg/dl)	126 ± 48	94 ± 20	0.02	93 ± 28	0.02

Table 1

* Comparison between baseline parameter and 3 months after surgery (Student's T for related samples)

+ Comparison between baseline parameter and 6 months after surgery (Student's T for related samples)



Graph 1

Relationship between VAT loss at 3 months (horizontal line) and Hb1Ac reduction (vertical line).

Bariatric surgery produces a statistically significant reduction in visceral adipose tissue from 3 months after surgery, being more significant in malabsorptive procedures, although without difference between them. In this study, an inversely proportional correlation was found between the proportion of VAT lost and HbA1c levels.

Trends in Diabetes Subgroups and Their Risk for All-Cause, Cardiovascular Disease and Diabetes-Specific Mortality in the US: A Data-Driven Reproducible Machine Learning Approach

Neftali Eduardo Antonio-Villa, Luisa Fernández-Chirino, Arsenio Vargas-Vazquez, Jessica Paola Bahena-López, Omar Yaxmehen Bello-Chavolla.

Background:

- Diabetes has been described as a heterogeneous entity which can be studied through data-driven subgroups (obesity related [MOD], severe-insulin deficient [SIID], severe-insulin resistant [SIRD] and age-related diabetes [MARD]). However, trends in prevalence and mortality risk are still unclear.

Aims:

- To analyze diabetes subgroup trends and to evaluate mortality risk in the US.

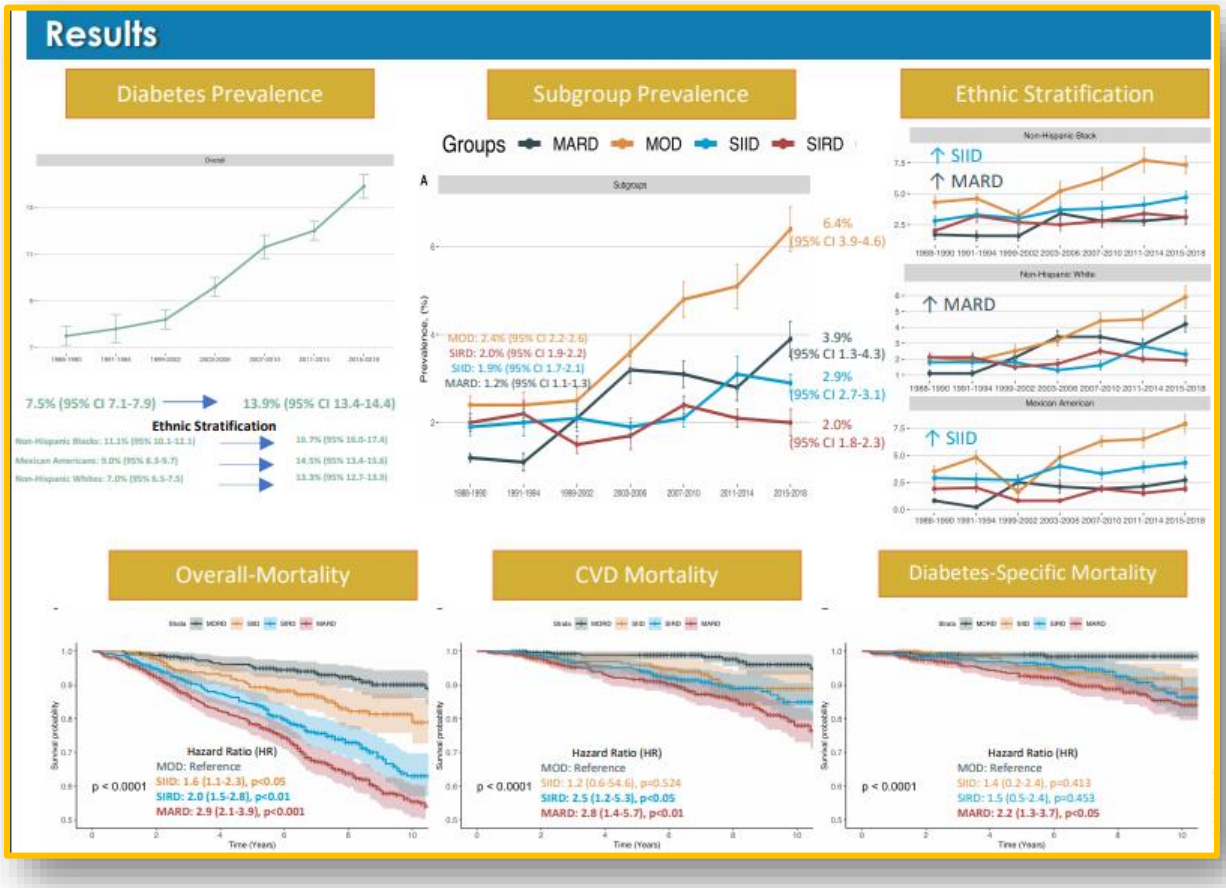
Methods:

- Data and follow-up causes of mortality (all-cause, cardiovascular disease, and diabetes specific) was collected from NHANES cycles 1999-2018. Subgroup diabetes classification was performed using the self-normalizing neural networks algorithm using clinical parameters (HbA1c, time since diabetes diagnosis, HOMA2-IR, HOMA2-B, and BMI) proposed by Bello-Chavolla et al (https://bit.ly/3jSm1xv).
- Prevalence was estimated using sample weights. 2-year cycles were used as a continuous variable to evaluate the biannual change (BC) of the overall prevalence of diabetes and subgroups.
- Trends were stratified according to race. Cox-proportional and Fine-Gray semiparametric hazard regression models were used to evaluate mortality risk.

Results:

- Data from 59,204 adult subjects was extracted for trend analysis. Follow-up information was obtained for 3,980 subjects. Diabetes prevalence in the US increased from 8.2% (95%CI 7.8-8.6) in 1999-2000 to 13.9% (95% CI 13.4-14.4) in 2017-2018 (BC 1.38%, 95% CI 1.20-1.56, p<0.001).
- Non-Hispanic Blacks had the largest increase in diabetes prevalence (BC: 1.40%, 95%CI 0.71-2.08, p=0.027), followed by Non-Hispanic Whites (BC: 1.36%, 95%CI 1.13-1.58, p<0.001), and Mexican Americans (BC: 1.33%, 95%CI 1.20-1.54, p<0.001).
- Regarding diabetes subgroups, MARD had the highest prevalence, with a moderate increase over time; however, MOD had the greatest increase over time (1.5%, [95%CI 1.2-1.8] to 4.5% [95%CI 4.0-5.0]; BC: 0.73% [95%CI 0.60-0.86], p<0.01).

- Both SIRD and SIID had non-significant increases in prevalence during the studied period. Non-Hispanic Blacks had an increase in the prevalence in MOD and SIID, Mexican Americans in MOD and SIRD, and non-Hispanic Whites in MOD and MARD.
- Compared with MOD, the risk for all-cause mortality was higher for MARD (HR 2.9 95% CI: 2.1-3.9), SIRD (HR 2.0 95% CI: 1.5-2.8), and SIID (HR 1.6 95% CI: 1.1-2.3). For CVD mortality, only MARD (HR 2.8 95% CI: 1.4-5.7) and SIRD (HR 2.5 95% CI: 1.2-5.3) displayed higher risk.
- For diabetes-specific mortality, only MARD (HR 2.2 95% CI: 1.3-3.7) was associated.



Diabetes prevalence in the U.S. has steadily increased from 1988 to 2018. MOD, MARD, and SIID had the highest increase during the studied period; SIRD and SAID remained unchanged. The risk for all-cause, CVD and diabetes-specific mortality was different among subgroups. Our results supports the use of diabetes subgroups for a better understanding of diabetes and its complications.

Accuracy of a Point-of Care Hemoglobin A1c Assay - A Community Outreach Project

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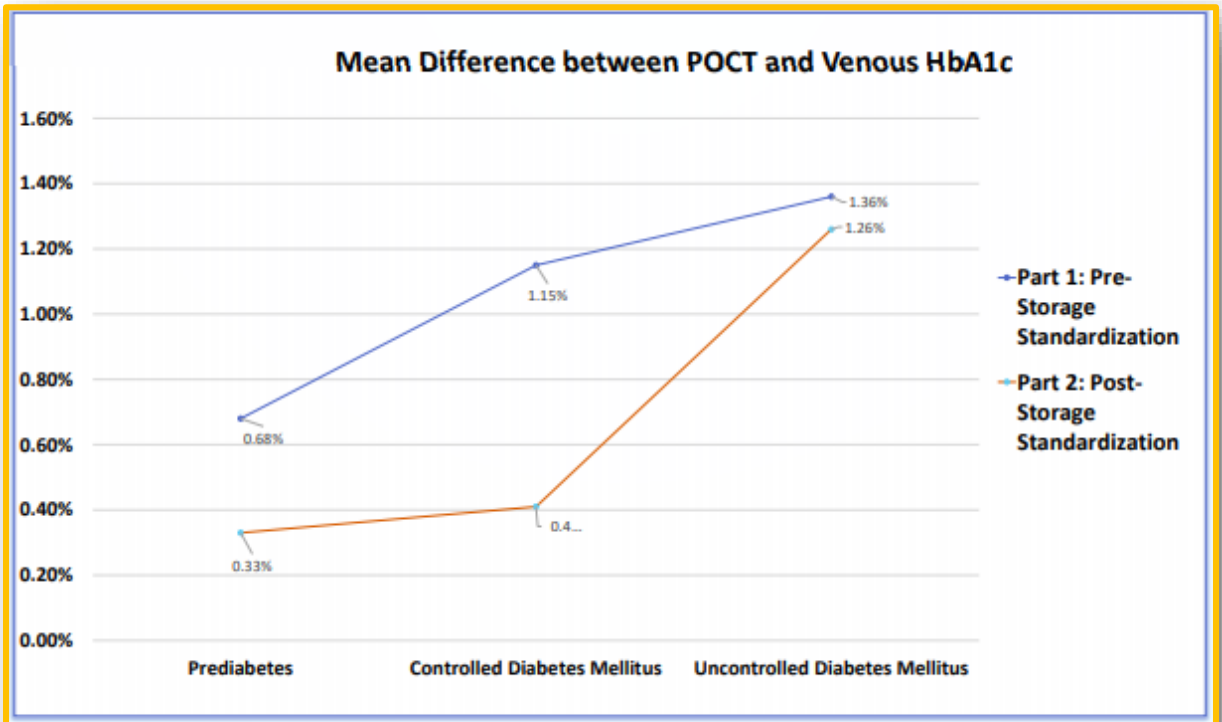
Abstract:

- Glycated hemoglobin (HbA1c) is an invaluable tool in diabetes mellitus (DM) management. Conventionally obtained via venous blood sampling, point-of-care (POCT) capillary HbA1c measurement offers an opportunity for immediate treatment modification, reduced cost & increased patient satisfaction.
- While previous studies using the POCT HbA1c test A1cNow+ have shown accuracy within a 0.5% range from the gold standard venous HbA1c, we noted discrepancy in our community health clinic & sought to evaluate the accuracy of POCT HbA1c levels compared to venous HbA1c levels to guide our clinical decision-making. In this 2-part study, we compared POCT HbA1c levels measured via a single use A1CNow+ HbA1c monitoring device & venous HbA1c samples measured by a standardized lab.
- Part1: after retrospective chart review, we identified 262 patients with prediabetes, Type1 or Type2 DM based on ADA guidelines who attended our clinic from January 2019-June 2019 & received POCT HbA1c with A1cNow+ testing during their visit. Of those cases, 47 patients also had a venous HbA1c at a standardized laboratory within 1 month of having their POCT HbA1c performed in our clinic.
- Part2: We noted variability in the temperature storage of A1CNow+ test strips. Storage was standardized to room temperature as per device instructions in June 2019. We subsequently reviewed charts from June 2019-December 2019 & identified 118 patients who had both POCT HbA1c & venous HbA1c measurement within a 1 month period.
- Patients was categorized into subgroups per ACP guidelines for DM control: prediabetic (HbA1c 5.7-6.4%), controlled DM (HbA1c 6.5 to 8.0%) & uncontrolled DM (HbA1c >8.0%).
- The average difference between POCT & venous HbA1c tests was calculated & analyzed for statistical significance using paired t test analysis.
- Part1: For patients in prediabetic, controlled & uncontrolled DM subgroups, the mean difference between A1cNow+ & standardized venous HbA1c testing was 0.68% (p= 0.004), 1.15% (p= <0.0001) and 1.36% (p= 0.0003) respectively.
- Part2: After standardization of test strip storage, the mean difference between A1cNow+ & venous HbA1c testing for prediabetic, controlled & uncontrolled DM patients was 0.33% (p= 0.002), 0.41% (p= 0.011) and 1.26% (p= <0.0001) respectively.
- POCT HbA1c provides a unique opportunity to immediately address glycemic control. Its advantages are especially apparent in a patient population with limited resources & poor follow up, as in our clinic.

- Although standardizing test storage improved overall concordance between A1cNow+ HbA1c testing & venous HbA1c, there was still a statistically significant larger mean difference in uncontrolled DM patients.



Graph 1. Mean POCT and Venous HBA1c difference Pre and Post Standardization of Test Storage in patients with prediabetes, controlled DM, and uncontrolled DM

In prediabetic & controlled DM patients, however, POCT HbA1c was accurate within previously published reports of a 0.5% range when compared to venous HbA1c. An algorithm has since been developed to guide our clinical decision making with these findings.

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