

KEY TAKEAWAY: We think that racial differences in heart health outcomes may be explained by more highs and lows in blood sugar and blood pressure in South Asians and fewer in non-Hispanic Whites.

Racial/ethnic Differences in Glycemic and Blood Pressure Variability Among Participants with Impaired Glucose Tolerance

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Study Setting

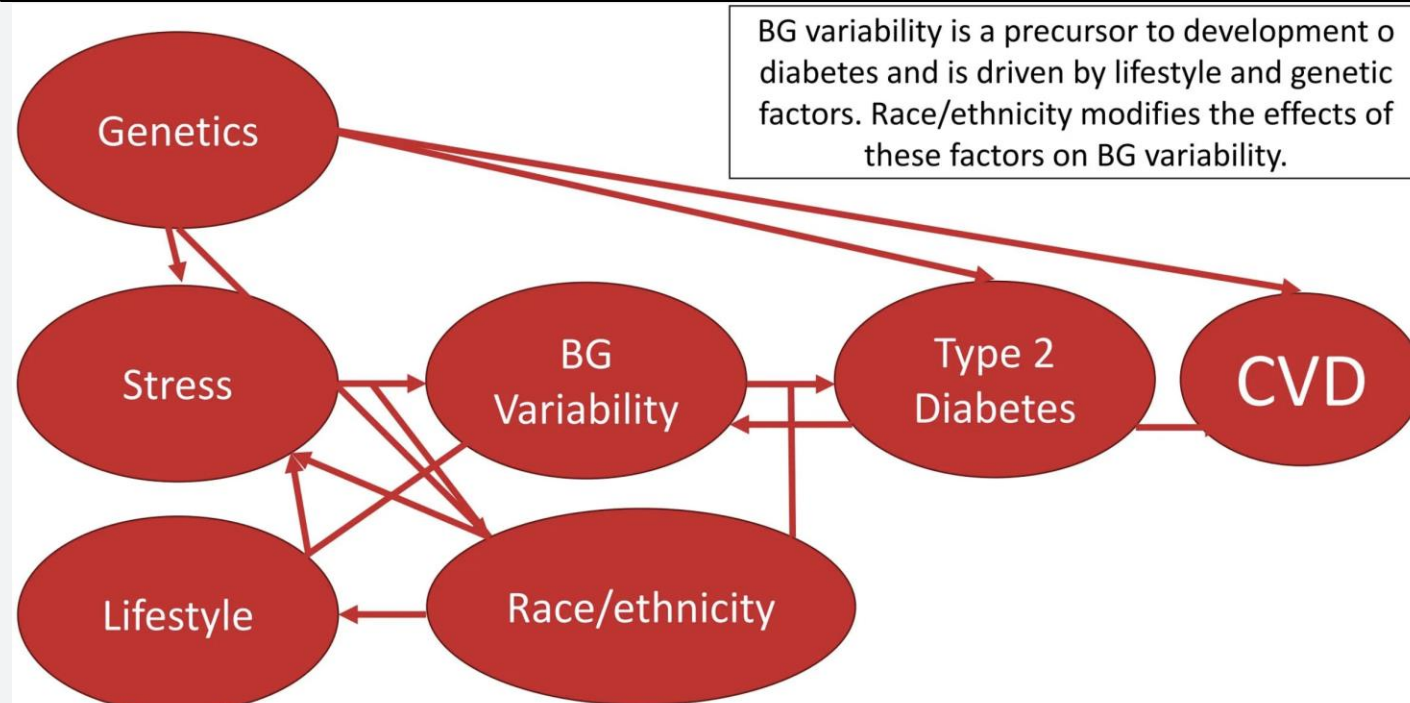
Research Institution: Rutgers University
Setting: Central NJ community locations, including places of worship, farmer's markets, public libraries, and collaborative health fairs

Background

U.S. South Asians have higher chance of diabetes, high blood pressure, and the difficulties related to these diseases compared to non Hispanic Whites, at a younger age and at less body fat.

Unique factors that increase chance of these diseases are more highs and lows in blood pressure and blood sugar even when they have the same level of diabetes (HbA1c). We don't know what the difference in highs and lows in South Asians versus non-Hispanic White groups and will measure this in the current study.

Causal Diagram



Aims

Aim 1: To calculate the daily burden of uncontrolled blood pressure uncontrolled blood glucose, highs and lows in blood pressure, blood glucose (BG), and heart rate and amount of body fat in U.S. South Asian adults less than 60 years with weakened glucose tolerance (A1c >5.7% or fasting BG >100 mg/dl or 2-hour post-prandial BG >140 mg/dl, not on any anti-diabetic medications) and lean muscle mass (<27.5 for Asian, <30 for non-Hispanic White).

Aim 2: To figure out whether U.S. South Asians have higher differences in blood sugar and blood pressure changes compared to non-Hispanic White adults.

Aim 3: To figure out whether psychosocial stress is a significant contributing factor to increased glycemic highs and lows.

Methods / Pilot Design

Inclusion Criteria: 1) 18-60 years old, 2) Access to smartphone, 3) Willing to wear CGM device and provide informed consent, 4) Able to attend APSEA health fair or come to the university

Exclusion Criteria: 1) Pregnant, 2) History of cardiac disease or insulin-dependent diabetes, 3) History of asthma, lung disease, cancer, autoimmune problems, heart disease since birth

Design: 10-day cross-sectional study

Procedure: Participants recruited at community screenings and fitted with the following devices:



During this 10-day period, participants will use the MyFitnessPal app to store photos of all meals, and record sleep time. Psychosocial stress will be captured via heart rate changes and skin responses.

Assessing Impact

- Continuous monitoring can provide unique evidence to calculate the amount of uncontrolled disease among U.S. South Asians and take educated guesses as to why U.S. South Asians suffer from diseases of small blood vessels at lower blood pressures and blood sugars.
- We will also look at the impact of stress, an under appreciated risk factor on highs and lows in blood sugar and blood pressure.
- Last, we will look to see if new methods of data collection, including taking photos of meals and journaling about stressors can improve stress measurement and remembering when, what, and how much you ate.

Outcomes: Uncontrolled blood glucose, blood pressure as defined by time-out-of-range. BG and BP highs and lows, as defined primarily by difference from the average across 10-day period.

Implementation measures: % completing all 10 days, % completing psychosocial measures

Potential barriers and challenges: 1) Difficulty completing measures during work hours, 2) Lack of complete dietary and physical activity documentation, 3) Logistics of data collection and participant onboarding, 4) Ensuring representativeness of South Asian ethnicity given wide variability even amongst South Asians

Community Partners/Community Engagement

Community Health Fairs: Religious places of worship, farmer's markets, public libraries, and collaborative health fairs

Community Engagement: Basic health screenings and health talks at community venues

Non-profit Organizations: American Preventive Screening and Education Association (APSEA), Rutgers Health Service Corps



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