
Background

The understanding role of Sex Hormone Binding Globulin evolved from transport protein for sex steroids to be a part in multiple and complex physiological interactions with various targets. 1

• Biological role in glucose metabolism has been explained through various mechanisms other than through sex hormones(testosterone and estrogen) on peripheral tissue. 2

• Sex Hormone Binding Globulin(SHBG) independently associated with insulin resistance. 3

• Studies indicated that low SHBG is associated with the increased risk of type 2 diabetes mellitus in men population. 2,5

• In women, post-menopausal - European Ancestry and inconsistent. 5

• NHANES - Generalizable sample from US population.

• SHBG - Clinical and public health implications in Type-2 Diabetes.

Study Objective

The objective of this study is to determine cross-sectional association between diabetes mellitus and the sex hormone binding globulin (SHBG) in US adult women of 20+ above years and to determine how it differs by menopausal status.

Hypotheses: -

i. The odds of having diabetes mellitus is higher in women with low serum SHBG levels compared to the women with normal serum levels.

ii. The odds ratio for the association between the diabetes mellitus and serum SHBG levels would be higher in postmenopausal women than in premenopausal women.

Methods

Population - Women of ages 20 and above.

Exclusion criteria - Pregnant women

Dependent variables - Diabetes Mellitus - Self-reported:

“other than during pregnancy, have you ever been told by a doctor or health professional that you have diabetes or sugar diabetes?”

Independent variable - SHBG - Serum and plasma SHBG

Immunnoassay:

Mayo Clinic’s Medical Laboratory Test Catalog.

Female (Non-pregnant) 18 – 144

Methods

• SAS 9.4.

• Descriptive statistics: Compare the characteristics of NHANES study population and test for statistical significance based on the outcome diabetes mellitus. (Table 1)

• Multivariable logistic regression:

  • Full adjusted model:

    - Age, race/ethnicity, smoking status, estrogen, testosterone, and BMI.

    - Stratified by menopause.

    - Final model

    - Race/ethnicity, testosterone, education, BMI and menopause, all the parameters statistically significant in this model. (Table 2)

Statistical Analysis

Results

• After adjusting for race and ethnicity, education, BMI, total testosterone, and menopause, the high SHBG was associated with a reduced risk of diabetes mellitus (adjusted OR 0.97, 95% CI 0.66-1.42) and increased risk for low SHBG (adjusted OR 3.40, 95% CI 1.86-6.21)

• Could not stratify the models based by menopause due to the lack of enough statistical power.

Discussion

• The inverse association of diabetes in both men and women is consistent with the systematic literature review and meta-analysis of 43 case-control studies in both men and women. 5,6

  • Unaccounted 20% missingness in the study sample.

  • Cross-sectional design cannot establish temporal relationship

  • Is the generalizability of the population in the study. Post-menopausal and pre-menopausal women. US women population.

Limitations

Strengths

References


