

Optimal glucose testing for the detection and diagnosis of prediabetes and type II diabetes mellitus in reproductive age women with polycystic ovarian syndrome

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Abstract

PURPOSE / OBJECTIVES: Polycystic ovarian syndrome (PCOS) is one of the most common metabolic conditions affecting reproductive-age women and its etiology is not completely understood. PCOS is diagnosed using the Rotterdam Criteria, in which patients must meet two of the three following criteria: (1) clinical or biochemical evidence of hyperandrogenism, (2) anovulation/oligomenorrhea and (3) polycystic ovarian morphology on ultrasound. Although not included in the Rotterdam criteria, one of the metabolic features of PCOS is glucose intolerance and insulin resistance. PCOS patients have a four to eight-fold increased risk of developing Type II Diabetes Mellitus (DM) making the diagnosis imperative. Current recommendations for glucose testing in this population are based on limited or inconsistent evidence. Therefore, we sought to determine which glucose test may be the ideal test to detect abnormal glucose metabolism in these patients.

METHODS: A retrospective chart review (IRB# 19-477) was performed for all women (ages 18-45 years of age) who presented to the Reproductive, Endocrinology and Infertility clinic at Southern Illinois University School of Medicine who received glucose testing {2-hour oral glucose tolerance test (OGTT), fasting GTT, Hemoglobin A1c (Hgb A1c) and insulin screening} at their initial visit between 07/01/2012 and 07/01/2019. Variables collected included glucose testing results, age, BMI and other laboratory results associated with PCOS management. Categorical variables are described as frequencies and percentages. McNemar tests were utilized to calculate concordance between test results.

RESULTS: Of the 730 charts that were reviewed, 390 women met the eligibility criteria, 59 subjects were excluded due to taking Metformin at the time of initial workup and 138 were confirmed to have PCOS based on the Rotterdam criteria. In reviewing glucose tolerance tests for PCOS patients, there was discordance (i.e., one test indicated the patient was within normal ranges and the other abnormal) noted between tests, especially in the obese (BMI \geq 30) patient population. For PCOS women with a BMI \geq 30 (n=93), there was discordance noted between the 2-hour OGTT and Hgb A1c tests in 27 patients (29%); of these, 9 were <30 years of age (33.3%). There was also discordance noted between fasting GTT and HgbA1c tests in 28 patients (30.1%); of these, 15 were <30 years of age (53.6%). In PCOS women < 30 years of age (n=65), there was discordance noted between the 2-hour OGTT and Hgb A1c in 13 patients (20%). Of the 13, 9 were considered

obese (69.2%). There was also discordance noted between fasting GTT and Hgb A1c in 23 (35.4%) of these women; of the 23, 15 were also obese (65.2%).

CONCLUSIONS: In PCOS patients who are also obese ($\text{BMI} \geq 30$), there is a discordance between glucose tolerance tests (2 hour OGTT, fasting GTT, Hgb A1c) in regards to accurately identifying patients with abnormal glucose metabolism. Providers should consider utilizing all glucose tolerance tests in combination to prevent false negatives and to enable better management of these patients.