The accuracy of diagnostic methods for diabetic retinopathy: A systematic review and meta-analysis

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Objective: The objective of this study was to evaluate the accuracy of the recommended glycemic measures for diagnosing diabetic retinopathy. Methods: We systematically searched MEDLINE, EMBASE, the Cochrane Library, and the Web of Science databases from inception to July 2015 for observational studies comparing the diagnostic accuracy of glycated hemoglobin (HbA1c), fasting plasma glucose (FPG), and 2-hour plasma glucose (2h-PG). Random effects models for the diagnostic odds ratio (dOR) value computed by Moses' constant for a linear model and 95% CIs were used to calculate the accuracy of the test. Hierarchical summary receiver operating characteristic curves (HSROC) were used to summarize the overall test performance. Results: Eleven published studies were included in the meta-analysis. The pooled dOR values for the diagnosis of retinopathy were 16.32 (95% CI 13.86-19.22) for HbA1c and 4.87 (95% CI 4.39-5.40) for FPG. The area under the HSROC was 0.837 (95% CI 0.781-0.892) for HbA1c and 0.735 (95% CI 0.657-0.813) for FPG. The 95% confidence region for the point that summarizes the overall test performance of the included studies occurs where the cutoffs ranged from 6.1% (43.2 mmol/mol) to 7.8% (61.7 mmol/mol) for HbA1c and from 7.8 to 9.3 mmol/L for FPG. In the four studies that provided information regarding 2h-PG, the pooled accuracy estimates for HbA1c were similar to those of 2h-PG; the overall performance for HbA1c was superior to that for FPG. Conclusions: The three recommended tests for the diagnosis of type 2 diabetes in nonpregnant adults showed sufficient accuracy for their use in clinical settings, although the overall accuracy for the diagnosis of retinopathy was similar for HbA1c and 2h-PG, which were both more accurate than for FPG. Due to the variability and inconveniences of the glucose level-based methods, HbA1c appears to be the

most appropriate method for the diagnosis diabetic retinopathy. © 2016 Martínez-Vizcaíno et al.