The sensitivity and specificity of nonmydriatic digital stereoscopic retinal imaging in detecting diabetic retinopathy.

Ahmed J, **Ward TP**, **Bursell SE**, **Aiello LM**, **Cavallerano JD**, **Vigersky RA**.

Division of Endocrinology and Metabolism, Howard University Hospital, Washington, DC, USA.

OBJECTIVE: The objective of this study was to determine the sensitivity and specificity of Joslin Vision Network nonmydriatic digital stereoscopic retinal imaging (NMDSRI) as a screening tool in detecting diabetic retinopathy. RESEARCH DESIGN AND METHODS: We reviewed the records of 244 patients with diabetes who had a dilated funduscopic examination (DFE) and NMDSRI done within 1 year of each other at four locations in the metropolitan Washington, DC, area. The images were transmitted through a local area network to a central reading location where they were graded by a single retinal specialist. RESULTS: Images of 482 eyes from 243 patients were included in the study. Four images did not transmit, and 35% of the images were not gradable. Of the remaining 311 eyes, there was 86% agreement in the grading between NMDSRI and DFE: 227 eyes with no diabetic retinopathy and 40 eyes with diabetic retinopathy. In 46 eyes (15%) there was a disagreement between gradings made by the two techniques. NMDSRI detected diabetic retinopathy in 35 eyes reported as normal by DFE, and in the remaining 11 eyes, the DFE grade was one grade higher than the NMDSRI grade. Adjudicated nonconcordant examinations were within one grade. In the 76 eyes with diabetic retinopathy, retinal thickness could not be assessed in 17 (21%) eyes. When the NMDSRI result was gradable, the overall sensitivity of NMDSRI was 98% and the specificity was 100% for retinopathy within one grade of the DFE. In the limited number of eyes that had diabetic retinopathy with macular edema (six), agreement with the clinical examination was 100%. CONCLUSIONS: NMDSRI is a sensitive and specific method for the screening and diagnosis of diabetic retinopathy, which may help improve compliance with the standards of eye care for patients with diabetes.