The Influence of Ultra-Wide Field Fluorescein Angiography on the Diagnosis and Management of Diabetic Retinopathy

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Purpose:
To study the influence of ultra-wide field (UWF) fluorescein angiography (FA) on the diagnosis and management of diabetic retinopathy (DR) when utilized in addition to UWF color fundus and red free (CF/RF) images.

Methods:
Ten experts independently reviewed 20 DR cases on a secure website and provided a diagnosis and management plan for each case, first based on UWF CF/RF images alone and again with the UWF CF/RF images and a corresponding UWF FA. Experts were also polled on their diagnostic confidence, their use of FA in clinical practice, and their opinions on the value of UWF FA in the cases presented. Primary outcomes included diagnostic sensitivity and specificity with and without the UWF FA based on the reference standard diagnosis. Secondary outcomes included intergrader agreement, expert confidence, management outcomes, and an analysis of experts’ opinions on the clinical utility of UWF FA.

Results:
Diagnostic sensitivity (95%CI) increased from 36% (29-43%) to 69% (62-75%, p<0.05) with the UWF FA. Intergrader agreement (Fleiss kappa statistic 0.29 (CI 0.21-0.27) vs 0.44 (CI 0.40-0.47), p<0.05) and expert confidence (38% vs 65%) also improved. Management changed from observation to treatment in 39% of responses. While 40% of experts did not request an FA when presented with a UWF CF/RF images alone, 80% found the UWF FA clinically useful when it was provided.

Conclusions:
Incorporating UWF FA may improve DR grading accuracy, intergrader agreement, and expert confidence compared to diagnosing with UWF CF/RF images alone. Diagnosis, management, and experts’ opinions on the utility of FA all changed when a corresponding UWF FA data was available. Further studies are needed to clarify the role of FA in DR diagnosis and management.