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The United Kingdom Diabetic Retinopathy Electronic Medical Record Users Group: Report 3: Baseline Retinopathy and Clinical Features Predict Progression of Diabetic Retinopathy

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ABSTRACT

Purpose: To determine the time and risk factors for developing proliferative diabetic retinopathy (PDR) and vitreous hemorrhage (VH)

Design: Multicenter, national cohort study

Methods: Anonymized data of 50,254 patient eyes with diabetes mellitus at 19 UK hospital eye services were extracted at the initial and follow-up visits between 2007 and 2014. Time to progression of PDR and VH were calculated with Cox regression after stratifying by baseline diabetic retinopathy (DR) severity and adjusting for age, gender, race, and starting visual acuity.

Results: Progression to PDR in 5 years differed by baseline DR: No DR (2.2%), mild (13.0%), moderate (27.2%), severe non-proliferative diabetic retinopathy (NPDR) (45.5%). Similarly, 5-year progression to VH varied by baseline DR: No DR (1.1%), mild (2.9%), moderate (7.3%), severe NPDR (9.8%). Compared to no DR, the patient eyes that presented with mild, moderate, and severe NPDR were 6.71, 14.80, and 28.19 times more likely to develop PDR, respectively. In comparison to no DR, the eyes with mild, moderate, and severe NPDR were 2.56, 5.60, and 7.29 times more likely to develop VH, respectively.

In severe NPDR, the eyes with intraretinal microvascular abnormalities (IRMA) had a significantly increased hazard ratio (HR) of developing PDR (HR 1.77, 95% CI 1.25-2.49, p=0.0013) compared to those with venous beading, while those with 4 quadrant dot blot hemorrhages (4Q DBHs) had 3.84 higher HR of developing VH (95% CI 1.39-10.62, p=0.0095).

Conclusions: Baseline severities and features of initial DR are prognostic for PDR development. IRMA increases risk of PDR while 4Q DBHs increases risk of VH.