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DESIGN. Retrospective observational study.

PURPOSE. The World Health Organisation (WHO) highlighted the importance of reporting trends and progress in preventing avoidable blindness in its 2009–2013, in order to evaluate the impact of different strategies. This study aims to understand the trends in the incidence of sight (SI) and severe sight impairment (SSI) certifications over a decade prior to the Covid-19 pandemic.

METHODS. Certifications for SI and SSI in England and Wales are received by the certification's office at Moorfields Eye Hospital, London.

RESULTS. Since 2010 there has been a gradual reduction in certifications for SI and SSI in England and Wales from 72.8 to 41.3 per 100,000 people with diabetes in England and from 82.3 to 55.5 per 100,000 in Wales. However, in Wales since 2016 there has been a gradual increase from 43.5 to 55.5 per 100,000 people with diabetes, similar to that recorded in 2013–2014 at 58.5 per 100,000. This coincides with an increase in the number of certifications for SI and SSI in Wales of 15.7% in those aged 12–34 year and 8% in those 55–69 years respectively, as well as an overall increase in all cause certifications in Wales since 2015 from 40.1 to 51.8 per 100,000 people.

CONCLUSIONS. Over the last decade there has been a gradual decrease in certifications of SI and SSI due to diabetic retinopathy in both England and Wales. However, in contrast to England there has been a slight reversal in this trend in Wales since 2016 which requires further investigation.

Characterization of Two-Year Progression of Risk Phenotypes of Diabetic Retinopathy

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DESIGN. Prospective observational 2-year study.

PURPOSE. To characterize the two-years progression of two diabetic retinopathy (DR) risk phenotypes in type 2 diabetes (T2D).

METHODS. A prospective longitudinal cohort study (CORDIS, NCT03696810) was conducted with 4 visits (baseline, 6-months, one-year and two-year).

Demographic and systemic data included age, sex, diabetes duration, lipidic profile and hemoglobin A1c (HbA1c). Ophthalmological examinations including visual acuity (BCVA), color fundus photography (CFP) and optical coherence tomography (OCT and OCTA), identified the presence of nonproliferative diabetic retinopathy (NPDR). Phenotype classification was performed, at 6-month visit, based on microaneurysm turnover (MAT, on CFP) and central retinal thickness (CRT, on OCT). Only risk phenotypes B (MAT < 6 and increased CRT) and C (MAT ≥ 6 with or without increased CRT) were included. ETDRS grading was performed at the baseline and last visits based on 7-fields CFP.

RESULTS. 133 T2D individuals were included in the study, 81 (60%) eyes classified as phenotype B and 52 (40%) eyes as phenotype C. Of these, 127 completed the two-year follow-up, 24 (19%) developed central-involved macular edema (CIME) and 2 clinically significant macular edema (CSME) (1.6%). In the two-year period, two-step severity progression (ETDRS) occurred only in one eye with phenotype C.

At baseline, eyes with phenotype C showed more capillary closure in the superficial capillary plexus (SCP), deep capillary plexus (DCP) and full retina (FR, $p < 0.001$) and increased FAZ area ($p < 0.001$), indicating more advanced microvascular disease and confirming the ischemia phenotype. During the two-year period both phenotypes, B and C, showed progression in GCL+IPL thinning ($p < 0.001$) and decrease in vessel density in the DCP (< 0.001). When analysing the two-year progression of each phenotype, only phenotype C revealed significant decrease in BCVA ($p = 0.02$) and enlargement of the FAZ ($p = 0.03$). CSME developed only in phenotype C whereas CIME occurred in both risk phenotypes.

CONCLUSIONS. In the two-year period of follow-up both phenotypes B and C showed progression in retinal neurodegeneration associated with progression in capillary closure identified by progressive decrease in vessel density of the DCP. CIME developed in both phenotypes and CSME only in phenotype C.

Characterization of Two-Year Progression of Capillary Closure in Nonproliferative Diabetic Retinopathy

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DESIGN. Prospective observational 2-year study.

PURPOSE. To characterize the two-year progression of capillary closure in different diabetic retinopathy (DR) risk phenotypes in type 2 diabetes (T2D).

METHODS. A prospective longitudinal cohort study (CORDIS, NCT03696810) was conducted with 4 visits (baseline, 6-months, one-year and two-year). Demographic and systemic data included age, sex, diabetes duration, lipid profile and haemoglobin A1c (HbA1c). Ophthalmological examinations including visual acuity (BCVA), colour fundus photography (CFP) and optical coherence tomography (OCT and OCTA) identified nonproliferative diabetic retinopathy (NPDR). Phenotype classification was performed, at 6-month visit, based on microaneurysm turnover (MAT, on CFP) and central retinal thickness (CRT, on OCT). Only risk phenotypes B (MAT < 6 and increased CRT) and C (MAT ≥ 6 with or without increased CRT) were included. ETDRS grading was performed at the baseline and last visit based on 7-fields CFP.

RESULTS. 133 T2D individuals were included in the study, 81 (60%) eyes classified as phenotype B and 52 (40%) eyes as phenotype C. Of these, 127 completed the two-year follow-up with 24 (19%) developing central-involved macular edema (CIME) and 2 (1.6%) clinically significant macular edema (CSME).

At baseline, eyes with phenotype C showed more capillary closure in the superficial capillary plexus (SCP), deep capillary plexus (DCP) and full retina (FR), $p < 0.001$ and increased FAZ area ($p < 0.001$), indicating more advanced ischemic disease. During the two-year follow-up period, the decrease in skeletonized vessel density indicating capillary closure, occurred mainly in the DCP in both phenotypes. Positive associations with the increased capillary closure were identified with GCL+IPL thinning (representing neurodegeneration) and decreased BCVA. Using a combination of parameters such as FAZ metrics, vessel density and degree of neurodegeneration it was possible to identify different risk profiles in eyes with the same ETDRS levels.

CONCLUSIONS. Significant progression in capillary closure was identified by a decrease in vessel density in the deep capillary plexus and increase in the FAZ area combined with progression in neurodegeneration (identifying different risk profiles in eyes with the same ETDRS grade). Eyes developing CIME had less decrease in vessel density of the SCP at baseline.

Addressing Technical Failures in a Diabetic Retinopathy Screening Programme

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DESIGN. A retrospective review of the technical failure (TF) rate over a 24-month period.

PURPOSE. The consequence of a TF at diabetic retinopathy screening, is that the patient must be reassessed at a second slit-lamp examination. This is inconvenient for the patient as well as costly to the screening programme. We looked to identify why TFs occur and if by modifying our protocol they could be avoided.

METHODS. The TF rate was determined at monthly intervals over a 24 month period from February 2019 to February 2021. An analysis for the specific reasons for TF was performed at six monthly intervals. Interventions introduced during the 24 months included the use of G Phenylephrine 2.5%, the capture of 3 instead of 2 fundal images, regular camera servicing, and multidisciplinary teaching (MDT) sessions.

RESULTS. In Feb 2019 the TF rate was 14% (529/3357), in Feb 2021 it had reduced to 5% (199/4410). The most common cause of TF at each 6 monthly analysis was cataract 48% (range 40–60). The number of artefact-related TF fell from 30% to 5% over 24 months. Non-modifiable causes for TF included asteroid hyalosis, corneal scarring, and patients not being able to appropriately position at the camera.

Following the introduction of MDT and conversion to three rather than two image acquisition, the TF rate reduced from 14% in Feb 2019 to 6% a month later. The introduction of G Phenylephrine 2.5% combined with MDT resulted in a decrease in the TF rate from 7% in July 2020 to 5% two months later.

CONCLUSIONS. MDT sessions alone or combined with other interventions, resulted in a significant reduction in the TF rate. This underlines the need for ongoing educational sessions for screeners. Cataracts account for the majority of TFs in our catchment area, and despite full dilation and multiple image acquisition, most patients with cataracts still require referral to our optometric services.

Teleophthalmology Diabetic Retinopathy Screening Program in Castilla y León

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DESIGN. A prospective cohort study was conducted in the Tele-ophthalmology Diabetic Retinopathy Screening Program in Castilla y León; between January 1 to December 30 of 2021, with 45 health centers recruiting in Valladolid and Palencia and a centralized reading center grading the images.

PURPOSE. Diabetic retinopathy (DR) is a leading cause of blindness worldwide. Tele-ophthalmology based diabetic retinopathy screening programs are an important