ARTIFICIAL INTELLIGENCE IN ROUTINE SCREENING FOR DIABETIC RETINOPATHY AT THE DIABETES OUTPATIENT CLINIC

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INTRODUCTION

The study focuses on the utilization of modern technologies employing artificial intelligence for the screening of diabetic retinopathy (DR) in patients with diabetes mellitus in routine clinical practice at the Diabetes Out-patient Clinic.

METHODS

Diabetic patients underwent fundus photography of both eyes using the non-mydriatic DRSplus® fully automated digital camera with a fundus imaging system featuring TrueColor Confocal technology by iCare, Finland, and the software product RetCAD™ developed by Thirona, the Netherlands, certified as class IIa. The camera and software employ artificial intelligence to analyze color fundus images for the presence of diabetic retinopathy and age-related macular degenaration (**Figure 1**).

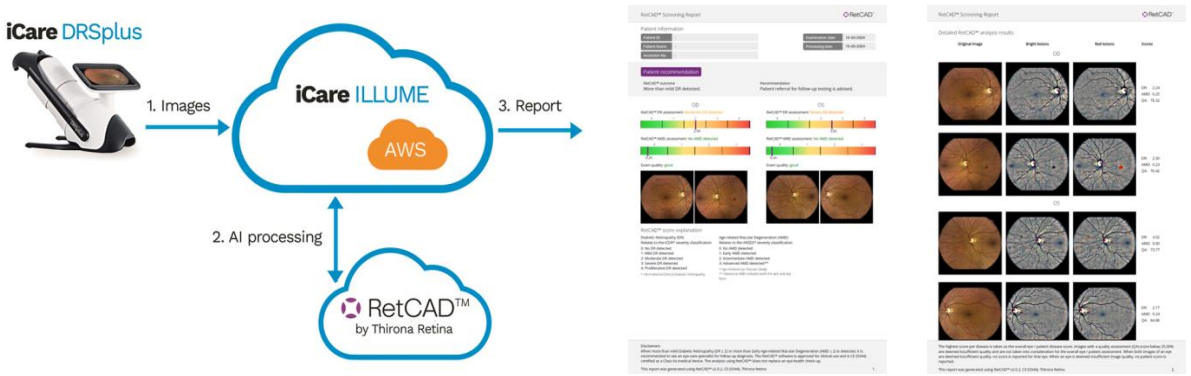

Figure 1 Solution diagram and Screening report

RESULTS

High-quality retinal imaging was evaluated in 354 diabetic patients, including 336 with type 2 diabetes (DM2T) and 18 with type 1 diabetes (DM1T). In the DM1T subgroup, diabetic retinopathy was not detected in 8 (44.4%) patients (**Figure 2**). Mild retinopathy was present in 4 (22.2%) patients, moderate retinopathy in 3 (16.7%), and severe retinopathy in 3 (16.7%). Proliferative diabetic retinopathy was not detected (0%) (**Figure 3**).

In the DM2T subgroup, diabetic retinopathy was not detected in 229 (68.2%) patients (**Figure 4**). Mild retinopathy was present in 69 (20.5%), moderate retinopathy in 30 (8.9%), severe retinopathy in 8 (2.4%), and proliferative retinopathy in 0 (0%) patients (**Figure 5**).

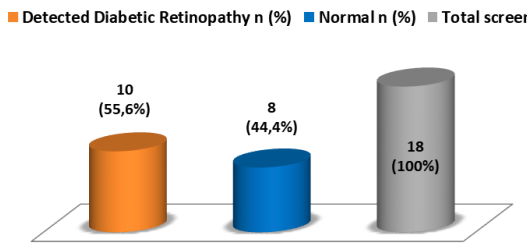

Figure 2 Diabetic retinopathy in DM1T, n (%)

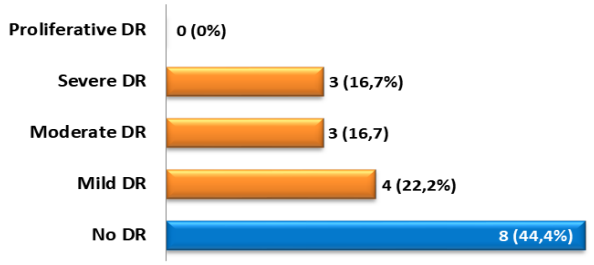

Figure 3 DR in DM1T, ICDR severity classification, n (%)

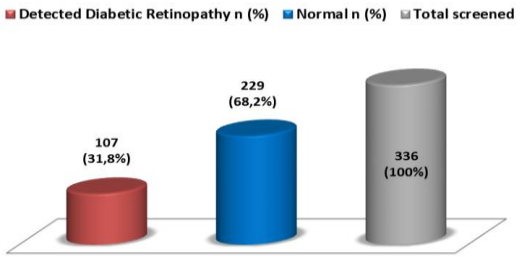

Figure 4 Diabetic Retinopathy in DM2T, n (%)

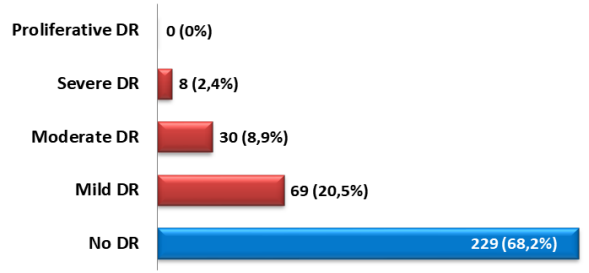

Figure 5 DR in DM1T, ICDR severity classification, n (%)

CONCLUSIONS

Advances in technology have made it possible to capture images with a non-mydriatic fundus camera and instantly analyze them using artificial intelligence. This streamlined process supports screening programs with speed and accuracy, making it easy to incorporate into everyday clinical workflows. Our study highlights that integrating fundus cameras with AI-driven algorithms offers an effective method for detecting, diagnosing, and grading diabetic retinopathy in routine practice. This approach facilitates earlier detection and intervention, helping to reduce the risk of serious complications.

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