



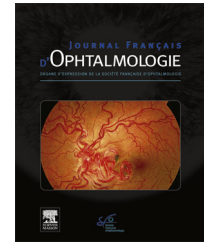
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ORIGINAL ARTICLE

Comparison of digital color fundus imaging and fluorescein angiographic findings for the early detection of diabetic retinopathy in young type 1 diabetic patients

Comparaison des résultats de la rétinophotographie couleur et de l'angiographie à la fluorescéine pour la détection précoce de la rétinopathie diabétique chez les jeunes diabétiques de type 1

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KEYWORDS

Microvascular changes;
Detection;
Diabetes;
Imaging method;
Retinal pathology

Summary

Purpose. – To compare the findings from digital 7-field color fundus (CF) photography and fundus fluorescein angiography (FFA) in young patients with diabetes mellitus (DM) type 1 without known diabetic retinopathy.

Methods. – In this prospective, observational cohort study, 54 type 1 diabetic patients were recruited. Participants had been diagnosed with diabetes mellitus (DM) for at least 6 years, had Best Corrected Visual Acuity of 20/25 or better and did not have any known retinal pathology. One hundred and seven eyes were analyzed. All patients underwent a complete ophthalmic examination in the Retina Service of a University Eye Clinic including digital CF imaging and FFA.

Results. – The mean age of the patients was 18.6 years. Mean duration of DM was 11.3 years, and mean haemoglobin A1c (HbA1c) level was 8.6%. Of the 107 eyes, 8 eyes (7.5%) showed microvascular abnormalities on CF images, while FFA images revealed

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changes in 26 eyes (24.3%). Hence, 18 of the 26 eyes showing abnormalities on FFA did not show any abnormalities on CF images. Mean DM duration in the patient group with detectable microvascular changes was found to be significantly higher compared to patients without changes, while no difference in HbA1c levels, serum lipid levels or blood pressure was observed. *Conclusions.* – Comparison of digital CF and FFA findings for the detection of diabetic microvascular changes in type 1 diabetic patients showed that FFA reveals more information about retinal vascular pathology for early detection of diabetic retinopathy.

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MOTS-CLÉS

Altérations
microvasculaires ;
Détection ;
Diabète ;
Méthode d'imagerie ;
Pathologie rétinienne

Résumé

Objectif. – Comparer les résultats de la rétinophotographie couleur (RC) de 7 champs et de l'angiographie à la fluorescéine du fond de l'œil (FA) chez des patients jeunes avec diabète sucré de type 1 sans rétinopathie diabétique connue.

Patients et méthodes. – Dans cette étude de cohorte prospective et observationnelle, 54 patients diabétiques de type 1 ont été recrutés. Les participants avaient des antécédents de diabète sucré pendant au moins 6 ans, avaient une meilleure acuité visuelle corrigée de 20/25 ou mieux et n'avaient aucune pathologie rétinienne connue. Cent sept yeux ont été analysés. Tous les patients ont subi un examen ophtalmique complet dans une clinique universitaire d'ophtalmologie, y compris RC et FA.

Résultats. – L'âge moyen des patients était de 18,6 ans. La durée moyenne de diabète était de 11,3 ans et l'hémoglobine A1c moyenne (HbA1C) était de 8,6 %. Huit de 107 yeux (7,5 %) avaient des anomalies microvasculaires sur la RC, tandis que 26 de 107 yeux (24,3 %) présentaient de pathologie rétinienne sur la FA. Par conséquent, 18 de 26 yeux avec pathologie sur la FA n'avaient aucune altération sur la RC. La durée moyenne de diabète était significativement plus élevée dans le groupe de patients avec des changements microvasculaires détectables en comparaison avec les patients sans changements. Au contraire, il n'y avait aucune différence dans l' HbA1c, les lipides sériques et la tension artérielle.

Conclusion. – La comparaison de la RC et FA a montré que la FA peut fournir plus d'informations de la pathologie rétinienne pour la détection précoce de la rétinopathie diabétique chez les jeunes diabétiques de type 1.

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Introduction

Diabetic retinopathy (DR) is a multifactorial disease with its development and progress affected by multiple genetic, metabolic and growth factors [1]. Due to the sight-threatening potential of the disease periodic screening for the detection of any DR signs at an early stage is regularly performed. Early and appropriate treatment could prevent blindness and is cost-effective [2]. A recent report of the causes of blindness certifications showed that diabetic retinopathy/maculopathy is no longer the leading cause of blindness, most likely due to the introduction of screening programmes [3]. Screening methods to detect and grade retinopathy include ophthalmoscopy, CF photography and FFA. Each of these methods has advantages and limitations [4]. According to the Early Treatment Diabetic Retinopathy Study, 30 degrees color stereoscopic photography of 7-standard fields is the current gold standard for evaluating the presence and grading DR findings [5–7]. On the contrary, FFA is useful for assessing the severity of blood-retinal barrier dysfunction in diabetic patients [8]. Early-diabetic microvascular changes that can be elucidated by FFA include

dye leakage, capillary dilatation, filling defects and microaneurysms [2].

The aim of this study was to compare the findings from digital 7-field CF photography and FFA in young, type 1 diabetic patients without known diabetic fundus alterations and to assess the agreement between the two imaging methods in an attempt to further address the issue of early detection of diabetic vasculopathy.

Methods

Subjects

The study was conducted in the Retina Service of the University Eye Clinic of Heraklion, Greece. In order to be included in the study, patients needed to be diagnosed with DM 1 for at least 6 years, have Best Corrected Visual Acuity (BCVA) of 20/25 or better in each eye and not to have any known vascular or structural retinal pathology. Exclusion criteria included patients with documented diabetic retinopathy in previous retinal examinations or media opacity. Subjects

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