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## Original article

# Results of a diabetic retinopathy screening. Risk markers analysis<sup>☆</sup>



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### ABSTRACT

**Objective:** To identify risk markers for retinopathy in patients from our geographic area, and to compare them with those published in other studies. To design a screening interval strategy, taking into account these results, and compare it with intervals suggested in published studies.

**Material and methods:** Cross-sectional observational study on 383 diabetic patients with no previous retinopathy diagnosis, who were screened for diabetic retinopathy. An analysis was made on the possible association between patient factors and the presence of retinopathy. **Results:** A greater probability for finding retinopathy in diabetic patients was associated to insulin treatment in our study, with a statistical significance level of 95%. In patients with less than 10-year onset of their diabetes, only mild retinopathy without macular edema was found.

**Conclusions:** Insulin treatment and time of onset of diabetes should be taken into account when designing efficient screening strategies for diabetic retinopathy.

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## Resultados de un cribado de retinopatía diabética. Análisis de marcadores de riesgo

### RESUMEN

**Objetivo:** Identificar marcadores de riesgo de presentar retinopatía en los pacientes de nuestro medio y compararlos con los identificados en otros estudios. Con esa información diseñar nuestra estrategia de intervalos de seguimiento contrastándolos con intervalos de seguimiento sugeridos en estudios publicados.

**Material y métodos:** Estudio observacional transversal sobre 383 pacientes diabéticos sin diagnóstico de retinopatía previa a los que se realizó cribado de retinopatía diabética.

#### Palabras clave:

Diabetes mellitus  
Cribado retinopatía diabética  
Prevalencia edema macular diabético  
Prevalencia retinopatía diabética

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Marcadores de riesgo  
Retinopatía diabética

Se analizaron la posible asociación entre factores de los pacientes y la presencia de retinopatía.

**Resultados:** En nuestro estudio el tratamiento con insulina se asoció con una mayor probabilidad de encontrar retinopatía en cribado de pacientes diabéticos sin retinopatía previa, con una significación estadística del 95%. En pacientes con menos de 10 años de evolución únicamente se encontraron retinopatías de fondo leves sin edema macular.

**Conclusiones:** El tratamiento con insulina y el tiempo de evolución de la diabetes deben tenerse en cuenta a la hora de diseñar estrategias eficientes de cribado de retinopatía diabética.

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## Introduction

Diabetic retinopathy is one of the main causes of visual deficit in our environment.<sup>1</sup> Its prevalence is estimated to increase in coming years. Current socioeconomic conditions call for a review of medical intervention with a view to enhance efficiency in the context of limited resources. Metabolic control improvements have demonstrated their efficiency for preventing the development of diabetic retinopathy.<sup>2,3</sup> In addition, the earliest diagnostic in diabetics type II is delaying the development of retinopathy vis-à-vis diagnostic.<sup>4</sup> In recent years this has brought about a debate on the optimum time interval between diabetic retinopathy detection screenings. There are data of studies carried out in other countries but it is important to have updated data for our country because our patients could exhibit different characteristics when compared to others, and the natural evolution of the disease is modified by the treatment provided. Thus, the objective of the present study is to confirm risk markers present in other studies in order to select patients who would require shorter intervals between retinopathy screenings.

## Materials and methods

An observational transversal study carried out with diabetic patients from March 13 to December 31, 2012. Said patients were screened for diabetic retinopathy with indirect ophthalmoscopy under midriasis in the Infanta Cristina University Hospital of Parla, where ophthalmological attention covers the entire area of reference. Examinations and data collection were carried out by eight ophthalmologists although the review and data analysis were performed by a single researcher.

The study included patients with diabetes type I and type II without previous retinopathy diagnostic and appointed as first visit (even though retinopathy screening was not the main reason for the visit). These were patients who were screened for the first time but also those who did not exhibit retinopathy in previous screenings. In the protocol agreed with primary care, examinations are annual with HbA1c numbers above 7 and every 2 years if equal to or above 7. The study does not include some diabetic patients without retinopathy diagnostic who were examined in our service due to being in follow-up for other ophthalmological pathologies.

The following risk factors were analyzed: evolution time of diabetes mellitus, diabetes treatment (diet, insulin, oral antidiabetics, presence of arterial hypertension, dyslipidemia and smoking habit). The number of patients with glycosylated hemoglobin was small and therefore finally excluded from the study. Risk factor data were provided by patients or included in the request made by the primary care physician. The classification of the International Clinical Diabetic Retinopathy Severity Scale was applied for grading retinopathy and macular edema.<sup>5</sup>

The statistical study was performed with the SPSS-Windows 13.0 statistical application. The Chi-square or Fisher's exact tests were utilized based on sample size. The statistical significance level was set at 5%.

## Results

The overall number of patients obtained during the above-mentioned period was 383, representing 80.75% of the first visits to our hospital. Of all study patients, 8.36% (32) were diabetes type I and 91.64% (351) were type II (Table 1). Type II patients treated with diet accounted for 2.61% (10) of the group, while those treated only with oral antidiabetics were 70.5% (270), with 5.48% (21) being treated with insulin, and 13.05% (50) were treated with oral antidiabetics plus insulin. Considering only type II diabetics, 2.85% were treated with diet, 76.92% with oral antidiabetics, 5.98% with insulin and 14.25% with oral antidiabetics plus insulin. As regards cardiovascular risk factors, 48.04% (184) exhibited dyslipidemia, 56.14% (215) high arterial pressure, and 17.49% (67) were smokers.

As could be expected, the largest amount of patients were first authentic screening visits within the first year from diagnostic (Fig. 1). The time from diagnostic of diabetes was not taken for five patients. Up to 5 years, the number of patients per year from diagnostic remains constant. As from the fifth year a progressive reduction in the number of diabetics without retinopathy seen at the first visit was observed. Very few cases were beyond 20 years, which limits the conclusions to be drawn about patients within that range. Concerning evolution time, a tendency toward round numbers was observed, which increased in parallel with the evolution time of the disease. As this information is mostly provided by patients, it will depend on their recall and for this reason are probably approximate numbers, even more so in long-standing diabetes.

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