Purpose

Retrospective study to analyze the relation between MA turnover, obtained from the initial period of 2 years of follow-up with a semi-automatic method ("MA-Tracker") based on color fundus photographs (CFP) and DR progression to CSME in the following 8 years.

Methods

Patients & Study design

Study design Retrospective study of 10 years of follow-up.

Patients Selection
113 eyes / patients; Type 2 diabetes and mild NPDR.

10 years of Follow-up
• First 2 years - characterization period
• Ophthalmological examinations + CFP every 6 months.
• Next 8 years
• Ophthalmological care in the same institution.

Examinations

Ophthalmological Examination
BCVA / Biomicroscopy / Intra-Ocular Pressure / Fundoscopy
CFP – Kowa fundus camera – 50º fov.

Systemic Examination
Metabolic control – HbA1c (%) levels; Blood Pressure levels - medicated when > 130/80 mmHg; Lipid levels.

CSME
Graded according the ETDRS protocol with established need for laser photocoagulation.

Data Analysis

Parameters in the first 2 years of the follow-up were compared between patients that developed CSME and patients that did not develop CSME during the following 8 years of follow-up.

Parameters collected in the first 2 years:
• Age and Diabetes duration
• HbA1c / BP / CH / HDL / LDL / TG
• Microaneurysm Turnover – formation (MAFR) / disappearance (MADR) rates
  Assessed with the "MA-Tracker" - a semi-automatic method that assists the grader to earmark MAs on CFP.

Statistical and Data Analysis
Non-parametric tests – Mann-Whitney and Chi-Square tests – were used to test for statistical significant differences between CSME and non-CSME eyes.

Results

Over the 10 years of follow-up period, 17 patients (15.0%) developed CSME (between the 4th and the 10th year) and 96 patients (85.0%) did not develop CSME.

CSME patients presented a higher HbA1c level at baseline and a higher MA turnover in the characterization period.

<table>
<thead>
<tr>
<th></th>
<th>CSME (n=17)</th>
<th>non-CSME (n=96)</th>
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</thead>
<tbody>
<tr>
<td>MA Turnover [MA/Year]</td>
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<tr>
<td>Formation Rate</td>
<td>9.2 ± 18.2</td>
<td>0.5 ± 1.2</td>
<td>&lt;0.001</td>
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<tr>
<td>Disappearance Rate</td>
<td>7.5 ± 16.6</td>
<td>0.5 ± 1.2</td>
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Conclusions

A high MA formation rate earmarked on color fundus photographs appears to be a good predictor of DR progression to CSME in type 2 diabetic patients with nonproliferative retinopathy.

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CR: None  Clinical Trial: NCT00840541

Retmarker – MA-Tracker is now fully automated

Since Spring 2009, MA-Tracker is commercially available as a fully automated software - Retmarker (www.retmarker.com)