Symptoms Predictive for the Later Development of Retinal Breaks

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Objective: To identify symptoms in patients with isolated posterior vitreous detachment predictive for the later development of retinal breaks.

Methods: Two hundred eighty consecutive patients seen with symptoms of posterior vitreous detachment were prospectively asked to complete a questionnaire detailing their symptoms. At the time of presentation and follow-up, all patients had a full ophthalmologic examination including slitlamp biomicroscopy with Goldmann 3-mirror contact lens after maximal pupil dilatation. Two hundred fifty patients with an isolated posterior vitreous detachment were included and reexamined 6 weeks after the onset of symptoms. If small retinal or vitreous hemorrhages were detected, patients were reexamined after 2 weeks.

Results: In 13 patients (5.2%) a retinal break was detected at reexamination. Logistic regression analysis with backward elimination revealed that symptoms of flashes in combination with clouds or multiple (>10) small dots at the time of the initial examination or an increase of floaters after the initial examination were statistically significantly (P<0.001) related to the development of new breaks. These symptoms had a predictive value for the presence or absence of a new retinal break of 75.0% and 99.6%, respectively.

Conclusions: Specific symptoms can identify patients at risk for the development of new retinal breaks after an initial examination in which no abnormalities were found and may obviate the need for follow-up appointments of patients not at risk.

PATIENTS AND METHODS

A prospective study of consecutive patients initially evaluated in the casualty department of the Rotterdam Eye Hospital, Rotterdam, the Netherlands, a community-based tertiary referral center, with acute symptoms suggestive of a PVD such as flashes or floaters was performed during a 10-month period between January 1, 1999, and October 31, 1999. Patients with preexisting ocular diseases and/or a history of ocular surgery or blunt trauma were excluded from this study.

All patients gave informed consent and completed a questionnaire detailing their symptoms at the initial examination and at their second visit. Patients were asked to draw and describe the flashes and floaters they experienced (ie, shape, color, number, location, and movement). The number of floaters was used to divide the study group into the following 4 classifications: A, patients with 1 to 3 floaters; B, patients with between 3 and 10 floaters; C, patients with more than 10 floaters; and D, patients describing a curtain or cloud. An increase in the number of floaters after the initial examination was defined as a change of group A or B floaters to group C or D floaters. Subjective vision reduction (SVR) was defined as the report of blurred vision not corresponding to a decrease in Snellen visual acuity. All patients had a full ophthalmologic examination at the first and second visit including indirect ophthalmoscopy and slitlamp biomicroscopy with a Goldmann 3-mirror contact lens after maximal pupil dilatation. Scleral indentation was not performed, nor was examination of the anterior vitreous for pigment granules part of the examination. Posterior vitreous detachment was only diagnosed when the site of the hyaloid detachment to the optic disc (Weiss ring) could be identified within the vitreous cavity. Findings from the 2 examinations were recorded on a customized form.

Patients found to have retinal breaks or retinal detachments at the first examination were referred for treatment and were excluded from the study group. If no preretinal or vitreous hemorrhages were found at the initial examination, patients were scheduled for a reexamination 6 weeks after the onset of symptoms. If retinal or vitreous hemorrhages in the absence of retinal tears were found, patients were scheduled for a reexamination 2 and 4 weeks after the initial examination. All patients were instructed to return earlier if symptoms worsened. Patients were discharged from follow-up if no significant pathologic abnormality was found at the 6-week examination. All data were entered into a database. To correlate specific symptoms and signs at the initial examination and during follow-up visits with the later development of retinal breaks, logistic regression analysis with backward elimination was performed, with the likelihood ratio to test for statistical significance.

Table 1. Symptoms at the Initial Evaluation of 250 Patients With Isolated Posterior Vitreous Detachment and the Number of New Retinal Breaks at Follow-Up Visits

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>No. (%) of Patients</th>
<th>No. (%) of Retinal Breaks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flashes only</td>
<td>21 (8.4)</td>
<td>1 (4.8)</td>
</tr>
<tr>
<td>Floaters only</td>
<td>34 (13.6)</td>
<td>0</td>
</tr>
<tr>
<td>SVR* only</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Flashes + SVR</td>
<td>1 (0.4)</td>
<td>0</td>
</tr>
<tr>
<td>Floaters + SVR</td>
<td>10 (4.0)</td>
<td>0</td>
</tr>
<tr>
<td>Floaters + flashes</td>
<td>116 (46.4)</td>
<td>7 (6.0)</td>
</tr>
<tr>
<td>Floaters + flashes + SVR</td>
<td>68 (27.2)</td>
<td>5 (7.4)</td>
</tr>
<tr>
<td>Total</td>
<td>250 (100.0)</td>
<td>13 (5.2)</td>
</tr>
</tbody>
</table>

*SVR indicates subjective vision reduction.

initial examination of which 8 developed a retinal break. Seven of these retinal breaks were detected at the 6-week examination. Of the 40 patients scheduled for reexamination after 2 weeks because of retinal or vitreous hemorrhages, new retinal tears were found in 5. Seven patients returned to the ophthalmic casualty department prior to their scheduled follow-up appointment because of worsening symptoms. A retinal break was found in 1 of these patients.

At the initial examination 21 of the 250 patients with isolated PVDs had symptoms of flashes alone (Table 1). One of these patients had developed a new retinal break at the 6-week reexamination. This patient developed floaters (group D) after the initial examination. Thirty-four patients mentioned floaters only, of which none was found to have a retinal break at follow-up. No patients mentioned SVR only.

The combination of flashes and floaters without SVR was mentioned by 116 patients. Seven of these patients developed a new retinal break after the initial examination. Sixty-eight patients mentioned SVR in combination with both floaters and flashes, of which 5 were found to have new retinal breaks. Eleven patients described SVR in combination with floaters or flashes. None of them developed a retinal break after the initial examination.

Apart from the 7 patients returning earlier because of a worsening of symptoms, a worsening of symptoms was mentioned by a further 24 patients at the scheduled 6-week appointment. At the initial examination 137 patients classified their floaters in group A (1-3 floaters). Only 1 patient with this number of floaters was found to have a retinal break at follow-up (Table 2 and Table 3). This patient mentioned an increase in the number of floaters to group C (>10 floaters) at reexamination. Sixty-eight patients classified their floaters as group B (3-10 floaters), of which 2 patients developed a new retinal break. At the second visit the number of floaters had increased to group C in both patients. Twelve patients described more than 10 floaters or dots (group C) at the initial examination. Six of these patients developed a new retinal break after the initial examination. Eleven patients mentioned a curtain or cloud (group D) at the first visit. Three of them appeared to have a retinal break at follow-up. No retinal breaks were detected in the 4 patients who noticed more flashes at follow-up.

Two of 9 patients with a positive family history of retinal detachment, 3 of 24 patients who had a history of retinal breaks, 4 of 64 patients with myopia of more
than 2 diopters, 2 of 11 patients with lattice, and none of the 21 pseudophakic patients (Table 4) developed a retinal break at follow-up. At the initial examination, 18 patients were found to have a vitreous hemorrhage; 3 developed a retinal break. Of 22 patients with retinal hemorrhages at the initial examination, only 2 had a retinal break at follow-up.

Logistic regression analysis with backward elimination of all relevant factors revealed that only the combination of flashes and more than 10 floaters (group C floaters) or a cloud or curtain (group D floaters) at the initial examination and an increase in the number of floaters after the initial examination were significantly (P < .001) related to the development of new retinal breaks. Using this analysis a predictive value to predict and exclude the development of a new retinal break could be estimated of 75.0% and 99.6%, respectively.

**Comment**

Many patients visit the ophthalmic casualty department because of symptomatic PVDs. Up to one third of these patients may have retinal breaks or retinal detachments at the initial examination. The remainder will be reexamined usually 6 to 8 weeks after the onset of symptoms, but only a few patients may develop a new retinal break in this time frame. These reexaminations claim considerable time and manpower of the ophthalmic casualty department, as each visit requires a detailed dilated fundus examination. In this study we tried to isolate specific symptoms or clinical signs at the initial examination that may predict the later development of retinal breaks to better enable us to schedule follow-up visits only for patients at risk.

In our study 13 patients (5.3%) developed new retinal breaks after the initial examination. Analysis of specific symptoms revealed that patients had difficulty with describing flashes in detail, but that they were better able to detail their report of floaters. Logistic regression analysis with backward elimination showed that the following factors significantly (P < .001) contribute to the prediction of new retinal breaks: symptoms of light flashes, more than 10 floaters or a cloud or curtain at the initial examination, and an increase in the number of floaters after the initial examination. Using these symptoms we are able to identify all patients with new retinal breaks in this study.

In a retrospective study of Dayan et al7 (n = 158), 3 of all reviewed patients with an isolated PVD were found to have a retinal break at follow-up. In contrast with our findings, this study revealed that the presence of SVR instead of the report of flashes and/or floaters was highly predictive for the development of a new retinal break. In our study, SVR was not an independent predictor for the development of retinal breaks, whereas detailed analysis of the symptoms proved the number of floaters to be an independent predictor.

The focus of our study was to determine factors that can identify patients with isolated PVDs who are at risk for the development of new breaks, whereas previous studies elucidated findings to identify patients with breaks at the initial examination.5-10 In contrast with previous study findings, we found symptoms of flashes and floaters to be predictive for the development of new retinal breaks. This may be explained by the fact that our study was prospective and incorporated a standardized and detailed history taking form.

Compared with the findings from previous studies,5,7 we found more retinal breaks at follow-up, suggesting that patients may have more floaters and/or flashes at the initial examination compared with our findings.
whereas the number of retinal breaks or retinal detachments found at the initial examination (12%) in our study is lower. The latter difference may be caused by the fact that our institution not only has a general emergency unit that serves the local community, but also is a referral center where patients with retinal breaks or detachments are directly sent in for treatment, bypassing the emergency unit. Furthermore, because this study concerned patients with an initial isolated PVD, several patients with breaks or detachments detected at the emergency unit were directly forwarded for treatment while their data were erroneously not processed for the study.

Our study findings showed that only patients who mention symptoms of light flashes in combination with multiple floaters or a cloud or curtain at the initial examination must be reexamined within 6 weeks. A follow-up visit for all other patients with an isolated PVD is only necessary if these symptoms occur or worsen after the initial visit. With these data it is possible to decrease the number of scheduled follow-up visits by 76%.

However, before we implement our conclusions, we will start another study to validate the predictive power of the presence or absence of light flashes in combination with group C or D floaters or an increase in the number of floaters for the development of a retinal break at the second visit.

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REFERENCES

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A look at the past . . .

On the Use of Dionin in Ophthalmology

DIONIN is an agent which energetically excites the lymph circulation, quiets pain, dilates the pupil, and gives good results in cases of iritis with posterior synechiae. L. Dor (Lyons, France) compares its effects with those produced by sinapisms on the skin. Jocos (Paris, France) had obtained good results in cases of chronic iritis by using 0.5% solution of dionin.