Management of Postoperative Inflammation: Dexamethasone Versus Flurbiprofen, a Quantitative Study Using the New Flare Cell Meter

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ABSTRACT
A consecutive, random, prospective study was conducted to compare the effect of topical dexamethasone and flurbiprofen drops on postoperative inflammation in patients undergoing extracapsular cataract extraction with lens implantation. Objective, quantitative measurements were made postoperatively, using the Kowa FC-1000 Flare Cell Meter. The two treatments were equally effective.

However, there were two problems with the study: postoperative inflammation was measured qualitatively rather than quantitatively; and, since the two nonsteroidal antiinflammatory drops used in the study were not commercially available, the results could not be applied clinically.

The recent availability of the Flare Cell Meter makes possible quantitative analysis of variations in protein and cells in aqueous humor. Papers evaluating this new technology have appeared in the Japanese literature. We used the Flare Cell Meter to determine the efficacy of a nonsteroidal antiinflammatory drop (flurbiprofen) in controlling inflammation after cataract extraction.

MATERIALS AND METHODS
The study was random and prospective, eliminating only patients with fixed miotic pupils. Also, it was semi-masked; i.e., at the time of slit lamp examination, the surgeon did not know whether a particular patient was receiving dexamethasone or flurbiprofen. Furthermore, the surgeon's subjective evaluation of cells and flare at the slit lamp was neither solicited nor considered: only the objective, quantitative measurements generated by the Kowa Flare Cell Meter were used.

Eighty-four consecutive patients with normal pupils had a standard extracapsular cataract extraction with posterior chamber lens implantation. All patients received four drops of flurbiprofen (Ocufen) in the 2 hours immediately preceding surgery. No steroids or
FIGURE 1: A comparison of the average postoperative flare at 1 day and 6 weeks postoperatively in the two groups of patients. One group (43 patients) was treated with dexamethasone (Maxitrol) and the other (41 patients) with flurbiprofen (Ocufen). The Kowa Flare Cell Meter is calibrated against albumin (Y axis).

FIGURE 2: A comparison of the average postoperative cell counts at 1 day, 1 week, and 6 weeks postoperatively in the two groups of patients.

FIGURE 3: The two groups of patients were unmatched in terms of the amount of initial flare. Figure 1 is therefore replotted here as percentage change in flare. This comparison shows even less difference between the two medications. We have also plotted the few patients who received both dexamethasone (Maxitrol) and flurbiprofen (Ocufen) (see Discussion). It is reasonable to believe the effect might be cumulative, but the number of patients (seven) is too small to allow such a conclusion.

FIGURE 4: Figure 2, replotted as percentage change in cells. We have also plotted the seven patients who received both dexamethasone (Maxitrol) and flurbiprofen (Ocufen) (see Discussion).

antibiotics were injected subconjunctivally after surgery. The patients were randomized into two groups simply by treating all patients one day with flurbiprofen and all patients the next surgical day with dexamethasone, etc. This method was chosen because it simplified instructing patients in groups.

One group (41 patients) received a drop of tobramycin (Tobrex) and a drop of flurbiprofen at the end of surgery and were placed on flurbiprofen and tobramycin drops twice a day thereafter. The other group (43 patients) received a drop of dexamethasone with an antibiotic combination (Maxitrol) and a drop of tobramycin at the end of surgery and was instructed to continue these twice a day thereafter. In a few cases the frequency of drops was increased when the amount of flare and cells seemed excessive, but patients were not switched from one medication to the other.

RESULTS

Flurbiprofen and dexamethasone controlled postsurgical inflammation in cataract patients equally effectively (Figs 1-4). As expected, since the
TABLE

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<thead>
<tr>
<th>Postoperative</th>
<th>1 Day</th>
<th>1 Week</th>
<th>6 Weeks</th>
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<tr>
<td>Maxitrol</td>
<td>41.6 ± 23.8</td>
<td>4.0 ± 5.7</td>
<td>0.7 ± 1.1</td>
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<tr>
<td>Ocufen</td>
<td>40.5 ± 24.8</td>
<td>7.3 ± 10.3</td>
<td>0.5 ± 0.8</td>
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<table>
<thead>
<tr>
<th>Postoperative</th>
<th>1 Day</th>
<th>1 Week</th>
<th>6 Weeks</th>
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<tbody>
<tr>
<td>Maxitrol</td>
<td>50.5 ± 37.8</td>
<td>24.2 ± 31.7</td>
<td>9.6 ± 10.3</td>
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<td>Ocufen</td>
<td>64.7 ± 47.0</td>
<td>41.3 ± 65.9</td>
<td>11.3 ± 8.5</td>
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**DISCUSSION**

Studies based on an observer's estimation of 1+, 2+, and 3+ cells and flare have always been, at best, crude. Dr Sawa's cell and flare members, now manufactured by Kowa as the FC-1000 Flare Cell Meter, is a powerful investigative tool. It is sensitive enough to measure the normal diurnal fluctuation in aqueous protein in groups of normal patients, and it is more than adequate for the management of iritis and especially for the analysis of postoperative inflammation.

The Meter can be used with only a few restrictions. The patient must be able to sit with head steady at the slit lamp during the measurements, and the pupil must be more than 2 mm in diameter. Also, of course, the cornea must be clear.

Just because flurbiprofen has been shown to be an effective means of managing postoperative inflammation does not mean that surgeons should use it instead of a steroid. It does mean, however, that there is an option in cases in which patients are steroid-sensitive or respond with an elevated pressure to the use of steroids. For example, postoperative nonsteroidal treatment should be considered for patients with advanced glaucoma.

It may be argued that this study is deficient, since there was no control group, ie, patients who received no treatment at all. Although we were planning to do a similar quantitative study of patients who had not been treated, it was not clear that it was ethical to follow patients with no treatment at all. Tsurimaki has recently reported a controlled study in which patients treated with indomethacin (another nonsteroidal antiinflammatory drug) after cataract surgery recovered markedly faster than untreated patients.

Other nonsteroidal antiinflammatory drops also should be tested.

It would also be interesting to see if nonsteroidal agents and steroids have an additive effect. Before beginning the present study we did treat seven patients with both flurbiprofen and dexamethasone, but the group was too small to yield statistically significant results. Also, either of these drops is so effective alone that a large population would be required to show any additive effect.

**REFERENCES**