Hydrophilic Acrylic IOL as a Drug Delivery System for the fourth Generation Fluoroquinolones

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Background

- Gradual increase of postoperative endophthalmitis (POE) in the USA since 1992.
- Unsutured clear corneal incision
- Bacterial adhesion to IOLs
- Most cases of POE are being attributed to the external surface flora.
- Preventive antibiotic treatment, although till recently not proven directly to be effective, is very popular.

Significant increase in resistance to Ciprofloxacin (37%).

Topical protocols of the fourth generation fluoroquinolones did not succeed in reaching the MIC90 for S. epidermidis in the anterior chamber for more than few minutes after the application.


5. McCulley JP. et al. Presented at the AAO annual meeting New Orleans October 2004


C Flex as DDS - Pilot Study

24 hrs soaking time


C Flex as DDS - Full Study
24 hrs soaking time


Comparison to topical drops

Results - Full Study
No clinical sign of toxicity after 24 hrs

Group A - presoaked IOL

Gati

Maxi

Results - Full Study
No clinical sign of toxicity after 24 hrs

Group B - "regular" IOL + drops

Gati

Maxi

Safety for the IOL

- 4 IOLs were placed in the Abs solutions (2 - Zymar, 2 - Vigamox) for 5 weeks.
- SEM analysis of the IOLs

Gatifloxacin
After 5 weeks soaking in Vigamox, IOLs became yellow.

C Flex as DDS – in Vitro Study
Different soaking time

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<thead>
<tr>
<th></th>
<th>Zymar</th>
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<th>Vigamox</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>1 week</td>
<td>24 hours</td>
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<tr>
<td>12 h</td>
<td></td>
<td>57.15±3.5</td>
<td>46.53±2.0</td>
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<td>(121%)</td>
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<tr>
<td>24 h</td>
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<td>70.65±5.14</td>
<td>55.57±1.0</td>
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<td></td>
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<td>(127%)</td>
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Vigamox

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<tr>
<th>Week</th>
<th>24 hours</th>
<th>10 minutes</th>
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<tr>
<td>12 h</td>
<td>84.95±2.05 (117%)</td>
<td>20.94±2.76 (29%)</td>
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<tr>
<td>24 h</td>
<td>106.94±2.85 (182%)</td>
<td>21.65±3.1 (29%)</td>
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- Longer soaking time (1 week):
  - Mild increase in the amount of the Ab that was released into the solution
  - Longer release time, mainly with Vigamox

- Shorter soaking time (10 minutes):
  - Release of ~30% of the amount of the antibiotic into the solution.

3 subgroups:
- 15 minutes soaking time in Vigamox
- 15 minutes soaking time in Zymar
- Intracameral injection of Vigamox (100mcg/0.1cc)

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Thank you for your attention