Assessment of the whole interceptive and post-fertilization effects of postcoital levonorgestrel


1. BACKGROUND

• It is possible to assess what proportion of interceptive effects of levonorgestrel (LNG) takes place as anovulatory action, taking into account:
  - the magnitude of the whole interceptive effect,
  - anovulatory potency
  - timing of administration (with respect to intercourse and ovulation)

• However, we don’t know the actual interceptive effect, because clinical trials didn’t use a placebo group. They used an estimation method, and their assessment of interceptive effect could be over-estimated.

2. OBJECTIVE

• To know the interceptive effect after a dose of LNG, and then:
  - assess the proportion of its anovulatory and post-fertilization effects.

3. METHODS

A recent systematic review (Piaggio et al.) pulled data from 6,794 women. LNG administered in the fifth day after intercourse showed a pregnancy probability of 5.2%, slightly lower than 6-8%, calculated by women

We extrapolated it in Mikolajczyk & Stanford’s graph (2007) for knowing what proportion of the whole interceptive effect takes place as anovulatory or post-fertilization effects.

Table 1. Input data extracted from ref. 6.

<table>
<thead>
<tr>
<th>group</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>days post-intercourse at intake</td>
<td>1 to 4 days</td>
<td>5 days</td>
</tr>
<tr>
<td>N (women)</td>
<td>6,564</td>
<td>230</td>
</tr>
<tr>
<td>pregnancies</td>
<td>66</td>
<td>12</td>
</tr>
<tr>
<td>days 2,3,4 vs. day 1</td>
<td>not significant</td>
<td></td>
</tr>
<tr>
<td>day 5 vs. day 1</td>
<td>OR 5.81 (IC95% 2.67-11.76)</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1. Pregnancy probability and assessment of interceptive effect

4. RESULTS

• The pregnancy rate was 1.0% taking the pill 1-4 days after intercourse (66 pregnancies in 6,564 women), vs. 5.2% if it was taken in the fifth day (12 in 230 women)

• It shows a decrease on pregnancy probability (interceptive effect) of 80.7% (IC95 64.9-89.4%); fig.1).

• In a conservative approach (administration of the pill 24h after intercourse), we obtained an anovulatory effect of 50%. Fig.2.

• However, taking into account epidemiological data showing lack of effect on pregnancy rates at a population level, we could assume an actual decrease that could be in the lower top of the confidence interval (64.9%).

• Extrapolating this effect, we obtained a contribution of at least 34% for non-anovulatory mechanisms and 66% for anovulatory effects (fig.2).

5. CONCLUSIONS

• As an alternative pre-fertilization effect is unlikely, we postulate at least 34% post-fertilization effects for postcoital levonorgestrel.

• This is statistically compatible with previous contradictory Noe et al’s data, as they observed only 35 women. They refused the post-fertilization effect, and that was a reference for FIGO to adopt the same epidemiologically unfounded opinion in March 2011.

References