THE EFFECT OF INTRAUTERINE INJECTIONS OF IODINE SOLUTION ON THE DURATION OF THE OESTROUS CYCLE IN COWS

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Summary. Thirty-four cows with ‘normal’ oestrous cycles showed a significant increase in the duration of the cycle following a single intrauterine injection of iodine solution between Day 13 and Day 16. The most distinctive lengthening (average 3.7 days) was observed in animals which had undergone treatment on Day 15. Intrauterine iodine injections from Day 4 to Day 12, on Day 17, and during oestrus did not affect the ‘normal’ oestrous cycle of fifty-three cows.

Kleinau (1952) noticed that the intrauterine injection of iodine solution reduced the duration of the oestrous cycle in cows. Nakahara, Domeki, Inui & Yamauchi (1967) and Morrow, Rowe, Ingalls & Hafs (1971) also observed a distinctive shortening after the infusion of Lugol’s solution on Days 3 and 4 of the oestrous cycle. If the iodine solution was injected only into the uterine horn on the side opposite to the CL, no shortening occurred, but injection of the solution into the uterine horn adjacent to the CL on Days 3 and 4 of the oestrous cycle led to a shortening of the cycle (Nakahara, Domeki & Yamauchi, 1971a, b). An average increase in the duration of the oestrous cycle of 5 days was observed by Nakahara et al. (1967) if iodine solution was injected into the uterus on Day 16 of the cycle. According to Morrow et al. (1971), injections of iodine solution on the 1st and the 11th day of the oestrous cycle did not affect the cycle length. The same applied if iodine solution was injected into the uterus in the middle of the oestrous cycle (Yamauchi, Nakahara, Kaneda & Domeki, 1971).

In our experiment, eighty-seven cows with oestrous cycles of ‘normal’ duration (21 days) were used (German black-pied cattle, average age 4 to 5 years). The test animals had calved more than 3 months before and had been artificially inseminated once or twice without success. Clinical examination did not reveal any pathological changes of the genital tract at the time of the uterine injection. Iodine solution (1: KI: distilled water = 1:3:200) was injected through the cervix at different times of the sexual cycle, and the cycle length was recorded. Earlier signs of oestrus were reported by the owners of the cows. In cases of ‘oestrus failure’, the cows were examined at 3-day intervals. The results are summarized in Table 1.
The significance of the differences between groups of cows was investigated by means of Student's *t* test.

In animals which were treated with an iodine solution once before Day 13 and on Day 17 of the oestrous cycle, the duration of the cycle remained unaffected. No iodine injections were given between Day 1 and Day 3 of the oestrous cycle. Cows undergoing intrauterine iodine infusions from Day 13 to Day 16 showed an average increase in the duration of the cycle of 1 to 4 days (maximum, 10 days).

These results suggest that the uterus of the cow has an influence on the lifespan of the CL and consequently upon the cycle length. This is in agreement with the results of other authors who noticed an alteration in the cow's cycle length after intrauterine application of plastic coils (Ginther, Woody, Janakiraman & Casida, 1966) or gelatinous substances (Yamauchi, Nakahara & Kaneda, 1956; Yamauchi, Nakahara, Kaneda & Inui, 1966; Yamauchi et al., 1971) as well as after uterine distention (Hansel & Wagner, 1960; Yamauchi, Nakahara, Kaneda & Inui, 1967; Yamauchi et al., 1971) or endometritis caused by infected semen (Hansel & Wagner, 1960; Kendrick & McEntee, 1967).

We can confirm the findings reported by Nakahara et al. (1967) and Yamauchi et al. (1971) that oestrus is reached, on average, 8 to 10 days after iodine solution has been injected in the late luteal phase. The regimen used in our experiment does not permit us to comment on the onset of oestrus 6 to 10 days after iodine injections on Day 3 or Day 4 of the cycle observed by Nakahara et al. (1967, 1971a, b) and Morrow et al. (1971), since no cows were treated by us on Day 3, and only a few were treated on Day 4. If iodine solution was injected during oestrus, between Days 4 and 12, or on Day 17, no effect on the oestrous cycle was recorded. This coincides with results published by Morrow et al. (1971) and Yamauchi et al. (1971). We also agree with the

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**Table 1. Effect of iodine solution administered at various stages of the oestrous cycle on the duration of the cycle in cows**

<table>
<thead>
<tr>
<th>No. of animals</th>
<th>Time of treatment (day of cycle)†</th>
<th>Mean duration of oestrous cycle (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Previous cycle‡</td>
</tr>
<tr>
<td>8</td>
<td>0</td>
<td>21·2</td>
</tr>
<tr>
<td>12</td>
<td>4 or 5</td>
<td>20·9</td>
</tr>
<tr>
<td>13</td>
<td>7 or 8</td>
<td>21·2</td>
</tr>
<tr>
<td>12</td>
<td>10 or 11</td>
<td>21·2</td>
</tr>
<tr>
<td>11</td>
<td>12 or 13</td>
<td>20·7</td>
</tr>
<tr>
<td>9</td>
<td>14</td>
<td>21·2</td>
</tr>
<tr>
<td>11</td>
<td>15</td>
<td>21·0</td>
</tr>
<tr>
<td>3</td>
<td>16</td>
<td>21·1</td>
</tr>
<tr>
<td>8</td>
<td>17</td>
<td>21·0</td>
</tr>
<tr>
<td>87</td>
<td>∅ 21·1</td>
<td></td>
</tr>
</tbody>
</table>

* *P < 0·05; ** P < 0·01; *** P < 0·001.
† Day of oestrus = Day 0.
‡ One to four cyclic periods.
observation of Yamauchi et al. (1971) that there is a close relationship between a temporary endometrial inflammation, if the former is caused by an intra-uterine iodine solution injection during the late luteal phase, and the life-span of the CL.

REFERENCES


