Ultrasound-Guided Transvaginal Injection of a Low Dose of FSH-LH into the Bovine Ovary as an Alternative Way to Stimulate Follicular Growth: Preliminary Results

P.E.J. Bols¹, T. Vanholder², J.L.M.R. Leroy², J.M.J. Aerts¹, A. Van Soom².

¹Laboratory of Veterinary Physiology, Department of Veterinary Sciences, University of Antwerp, Universiteitsplein 1 – Gebouw U, 2610 Wilrijk, Belgium
²Department of Reproduction, Obstetrics and Herd Health, Faculty of Veterinary Medicine, University of Ghent, Salisburylaan 133, 9820 Merelbeke, Belgium

Introduction

Some researchers claim a positive influence of FSH-LH treatment on the number of punctured follicles and retrieved oocytes in stimulated cows (1). Others found comparable overall results between protocols with one stimulated vs 2 non-stimulated ovum pick-up (OPU) sessions per week (2).

FSH-LH causes explosive follicular growth and a substantial increase in ovarian blood supply when administered at the superovulation dose, which limits repeated use in a twice-weekly OPU regime.

Aims

1. To investigate the feasibility of injecting FSH-LH directly into the ovary at a substantially lower dose.
2. To study the local actions of an intra-ovarian FSH injection on follicular dynamics.

Materials and Methods

- Six cows with normal reproductive tract, prepared as for ultrasound-guided transvaginal Ovum Pick-Up (3).
- Both ovaries were injected using a multiple angle 5 MHz transducer (Esaote-PieMedical BV, Maastricht, the Netherlands), fitted next to needle guidance system in an OPU handle.
- A total dose of 160 µg pFSH and 32 µg pLH, divided over 8 injections (2/day) of 1 ml diluted FSH-LH in each ovary (Stimufol, Ulg FMV, Liège, Belgium), corresponding to one third of the standard superovulation dose.

Results

- Feasibility of intra-ovarian injection using the OPU equipment proved to be good.
- Preliminary results of intra-ovarian FSH-LH injection on follicular dynamics can be summarized as follows:

<table>
<thead>
<tr>
<th>Treatment group</th>
<th>Total number of follicles with a diameter &gt; 5 mm following a four day treatment (+/- SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative control cow: injected with physiological saline</td>
<td>1 follicle</td>
</tr>
<tr>
<td>Intra-ovarian injections (total dose of 160 µg pFSH and 32 µg pLH) (n=4)</td>
<td>5.5 +/- 4.2 follicles (average +/- SD)</td>
</tr>
<tr>
<td>Positive control cow: injected IM following the standard superovulation treatment (total dose of 500 µg pFSH and 100 µg pLH)</td>
<td>21 follicles</td>
</tr>
</tbody>
</table>

Conclusions

- Intra-ovarian injection using the OPU equipment proved to be feasible and repeatable.
- Intraovarian injection of a reduced dose of FSH-LH causes a reduced stimulatory effect resulting in an acceptable increase of the number of follicles suitable for puncture.
- Additional work is needed to fine tune the stimulation protocol.

References