Experimental study about the effect of oral meloxicam administration to sows on the mortality of suckling piglets, growth and on the immunoglobulin G transfer to piglets

Eva Mainau, Déborah Temple, Xavier Manteca

Department of Animal and Food Science, School of Veterinary Science, Universitat Autònoma de Barcelona, 08193 Bellaterra (Barcelona), Spain

Meloxicam is not approved for the indication investigated in the study. The specifications in this document shall only be used as scientific information about research activities.
Hypothesis:

The objective of the study was to investigate if the oral meloxicam administration to sows during farrowing reduces pain and infection and increases the well-being as well as the suckling behaviour of the sow. This will lead to improved intake of milk in piglets which has a positive effect on the transfer of maternal immunity, weight gain and survival capability of the piglets.

Background:

Trauma and infections in connection with the farrowing and, in particular, with an impaired course of delivery, have a negative effect on the well-being of the sow. At the start of the quoted study, results of previous studies with meloxicam, a non-steroidal anti-inflammatory drug (NSAID), lead to the conclusion that the one-time administration of meloxicam already leads to the relief of inflammation and pain after farrowing. This results in the reduction of discomfort associated with farrowing and the promotion of the well-being of the sow. Further studies have shown the benefit of NSAIDs for recovery after farrowing as well as the effects on the maternal social behaviour of the sow. Impaired maternal behaviour affects piglet growth and increases the danger of piglet losses due to crushing.

Results:

After the oral administration of meloxicam to the sows at the time of farrowing, an increase in daily gain of their piglets during the lactation period was observed (piglets of the sows treated with meloxicam grew +19g/day compared to the placebo group). As a result, the piglets of the meloxicam group were heavier at weaning. On the first and second day of suckling, the IgG concentrations in piglets of sows that were treated with oral meloxicam, were distinctly and significantly above the values of the piglets of the control sows (placebo group). This positive effect of meloxicam was significant at the samplings on the 1st and 2nd day of life and differences were not detected by day 21.

Conclusion:

After the oral administration of meloxicam to sows at the time of farrowing, their piglets showed distinctly higher IgG concentrations during the first 48 hours of life. This is of enormous significance, because the piglets are born (almost) without humoral antibodies due to the impermeability of the placenta. Furthermore, the piglets of meloxicam-treated sows showed higher daily weight gain than the piglets of untreated sows. Since farms are increasingly using hypoprolific sows and due to the lower birth weights associated with this, early and sufficient supply of energy from milk during the first days of life plays a key role in successful piglet production.
In addition, the lack of motherly behaviour reduces early and sufficient intake of milk by the piglets. Due to the impermeability of the placenta, the piglets are born without humoral antibodies. In this context, the sufficient supply of milk is a critical factor for the piglets since colostrum plays a key role for the early uptake of energy and immunoglobulins in the piglet.

**Study design:**

30 sows were included in the randomised, placebo controlled study. 15 sows received meloxicam (Metacam® oral suspension, Boehringer Ingelheim) as soon as possible after the onset of farrowing, the remaining 15 sows underwent the treatment procedure at the same time but they received a mock administration (Placebo group). During the suckling period, the sows were monitored and the number of treatments per sow recorded. The weight of 325 piglets from both treatment groups was recorded at birth and at weaning. This was used to calculate the average daily weight gain of the piglets during lactation. At day of life 1, 2 and 20, blood was collected from four piglets (2 suckling a front teat and 2 suckling a back teat) per litter and this was tested for immunoglobulin G (IgG) content.
Hypothesis:
The objective of the study was to investigate if the oral meloxicam administration to sows during farrowing reduces pain and infection and increases the well-being as well as the suckling behaviour of the sow. This will lead to improved intake of milk in piglets which has a positive effect on the transfer of maternal immunity, weight gain and survival capability of the piglets.

Background:
Trauma and infections in connection with the farrowing and, in particular, with an impaired course of delivery, have a negative effect on the well-being of the sow. At the start of the quoted study, results of previous studies with meloxicam, a non-steroidal anti-inflammatory drug (NSAID), lead to the conclusion that the one-time administration of meloxicam already leads to the relief of inflammation and pain after farrowing. This results in the reduction of discomfort associated with farrowing and the promotion of the well-being of the sow. Further studies have shown the benefit of NSAIDs for recovery after farrowing as well as the effects on the maternal social behaviour of the sow. Impaired maternal behaviour affects piglet growth and increases the danger of piglet losses due to crushing. In addition, the lack of motherly behaviour reduces early and sufficient intake of milk by the piglets. Due to the impermeability of the placenta, the piglets are born without humoral antibodies. In this context, the sufficient supply of milk is a critical factor for the piglets since colostrum plays a key role for the early uptake of energy and immunoglobulins in the piglet.

Study design:
30 sows were included in the randomised, placebo controlled study. 15 sows received meloxicam (Metacam® oral suspension, Boehringer Ingelheim) as soon as possible after the onset of farrowing, the remaining 15 sows underwent the treatment procedure at the same time but they received a mock administration (Placebo group). During the suckling period, the sows were monitored and the number of treatments per sow recorded. The weight of 325 piglets from both treatment groups was recorded at birth and at weaning. This was used to calculate the average daily weight gain of the piglets during lactation. At day of life 1, 2 and 20, blood was collected from four piglets (2 suckling a front teat and 2 suckling a back teat) per litter and this was tested for immunoglobulin G (IgG) content.

Results:
After the oral administration of meloxicam to the sows at the time of farrowing, an increase in daily gain of their piglets during the lactation period was observed (piglets of the sows treated with meloxicam grew +19 g/day compared to the placebo group). As a result, the piglets of the meloxicam group were heavier at weaning. On the first and second day of suckling, the IgG concentrations in piglets of sows that were treated with oral meloxicam, were distinctly and significantly above the values of the piglets of the control sows (placebo group). This positive effect of meloxicam was significant at the samplings on the 1st and 2nd day of life and differences were not detected by day 21.

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Daily gain (g/Tag)</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated control</td>
<td>168</td>
<td>216.8&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4.5</td>
</tr>
<tr>
<td>Meloxicam group</td>
<td>170</td>
<td>235.6&lt;sup&gt;b&lt;/sup&gt;</td>
<td>3.4</td>
</tr>
</tbody>
</table>

<sup>a,b</sup> p<0.001; ** p < 0.01; * p < 0.05
**Conclusion:**

After the oral administration of meloxicam to sows at the time of farrowing, their piglets showed distinctly higher IgG concentrations during the first 48 hours of life. This is of enormous significance, because the piglets are born (almost) without humoral antibodies due to the impermeability of the placenta. Furthermore, the piglets of meloxicam-treated sows showed higher daily weight gain than the piglets of untreated sows. Since farms are increasingly using hyper-prolific sows and due to the lower birth weights associated with this, early and sufficient supply of energy from milk during the first days of life plays a key role in successful piglet production.

**DAILY WEIGHT GAIN**

+19g

**INCREASED IgG CONCENTRATION**

in piglet serum in first 48 hours of life
Metacam®
15 mg/ml oral suspension for pigs
Metacam®
100 ml

Boehringer Ingelheim

metacam®
Making Life Better!