

Effect of Ibuprofen Administration on Postural Changes in Post-Parturient Sows

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Summary and Implications

Loss of piglets due to crushing is an unnecessary loss that creates both a financial and welfare concern for the swine industry. Sows in the wild lie more quietly after farrowing compared with sows in farrowing crates. The restless behavior of the sow in a farrowing crate increases the chances that she will crush her offspring. Data collected during this study indicate that the discomfort a sow feels associated with lying on a hard surface after farrowing can not be relieved with ibuprofen. This discomfort causes her to change positions more frequently, increasing the chances that she will crush her piglets. Emphasis needs to focus on allowing the post-parturient sow to rest quietly if a decrease in piglet crushing is to be realized.

Introduction

Piglet mortality is one of the most detrimental factors influencing the proficiency of the swine industry today. A major cause of this mortality is due to sows lying on their piglets causing them to be "crushed." Almost 80% of all mortality occurs during parturition and within the first 3 to 4 days of life, and it is during the first 48 h post-farrowing that the majority of crushing deaths occurs.

Farrowing crates were introduced to save piglet lives by decreasing the rate of crushing, but their efficacy is debatable. Although crates reduce mortality, loss due to crushing is still estimated to be between 4.8% and 18%. Even at the modest rate of 5%, in 1997 crushing cost swine producers in the United States approximately \$695 million (calculated from USDA data).

For modern, lean-type sows, farrowing crate flooring is relatively hard despite the use of plastic-coated expanded metal. This is evident by many sows developing pressure sores, which probably contribute to the sows' discomfort. There is undoubtedly pain before the sore is formed, and an animal with pressure sores will shift position to relieve the pressure on that spot. These sensitive areas may cause restlessness in the sow, thus increasing her chances of crushing piglets.

We hypothesized that alleviating the sow's pain would result in a decrease in body position changes. Previous research in our laboratory upheld this hypothesis. Administration of butorphanol tartrate, a potent analgesic, allowed sows to rest more peacefully after farrowing. However, there are no analgesics approved for use in swine

and the prescribed use of butorphanol is further impaired because it is a controlled substance. Therefore, this study was designed to determine if administration of ibuprofen (a nonsteroid anti-inflammatory) to sows would allow them to lie more restfully. A more restful sow that does not change positions frequently will have less opportunity to crush her piglets.

Materials and Methods

This study was designed to examine the use of an analgesic on the reduction of sow body position changes post-farrowing. Reduction in sow body position changes may lead to a decrease in crushing rates. Thirty-three Yorkshire \times Landrace sows were assigned to either the control group (C, $n=17$) or the ibuprofen-treated group (IB, $n=16$) and observed during farrowing for any complications. Sows averaged 181.7 ± 8 kg, were on their first parity and had medium scores for body/fat composition. All sows gave birth in traditional farrowing crates that were 1.5×2.13 m with a width of 61 cm for the sow and creep areas on both sides for piglets (45.72 cm \times 2.13 m).

The C sows were allowed to farrow naturally and were not given analgesic. The IB sows were administered ibuprofen orally in applesauce at a dose of 10 mg/kg body weight (BW) within 4-h post-farrowing. Ibuprofen was subsequently administered every 6 h until 3 days post-farrowing. Data were collected on all sows with time-lapse photography (1 frame/.4 s). Piglet activity and behaviors were noted at the time of each injection (four times a day), and by video analysis.

Sows may perform more body position changes because pressure sores will cause an animal to move more frequently to avoid the sensitive area. To assess the degree of comfort of each sow, body position changes were recorded when sows switched between lying, sitting, and standing. Research has shown that it is these movements that are responsible for crushing piglets.

Results

Sows from both treatments produced $9.6 \pm .7$ live born piglets weighing $1.7 \pm .2$ kg, and crushed $.24 \pm .1$ piglets. Sows receiving ibuprofen spent a similar amount of time standing during each 12-h period and they performed a similar amount of position changes as the control sows ($P > .5$; Figure 1). Analysis of the data for each 12-h period also indicated that the sows in the control and ibuprofen treatment behaved similarly after farrowing ($P > .10$).

Discussion

The results from this experiment indicate that ibuprofen is not effective at relieving the discomfort of the sow after she farrows. Our previous research, with butorphanol

tartrate, indicates that sows are experiencing pain after farrowing and trying to adjust their body to relieve this discomfort. Because butorphanol is a potent analgesic, especially compared with ibuprofen, the results from the current study indicate that sows are experiencing a significant amount of discomfort in the post-farrowing environment.

The level of sow activity during this study, in both the control and the ibuprofen treatment, is similar to that of the control sows that were used in the study that tested butorphanol tartrate. The mean number of position changes in the current study was approximately 16.5 and the control sows in our previous study (sows that did not receive any analgesic) performed approximately 15.7 position changes during a 12-h period. This comparison illustrates the complete lack of effect on body position changes by ibuprofen.

Our previous research indicates that sows are experiencing pain in the post-parturient environment. Currently, no suitable analgesic is available to relieve this discomfort. These facts, incorporated with the realization that each time the sow adjusts her position in the farrowing crate, to either roll from side to side or to stand and lie down, she places her piglets in danger of becoming crushed; illustrates the need to develop a farrowing environment that creates a greater degree of comfort for the sow. Possibilities to help create a better match between the sow and her environment include allowing her freedom to leave the farrowing crate between nursings, creating a softer flooring, or allowing her to establish a greater protective fat covering. All of these possibilities would allow the sow to rest more peacefully after farrowing and could have profound effects on piglet survivability.

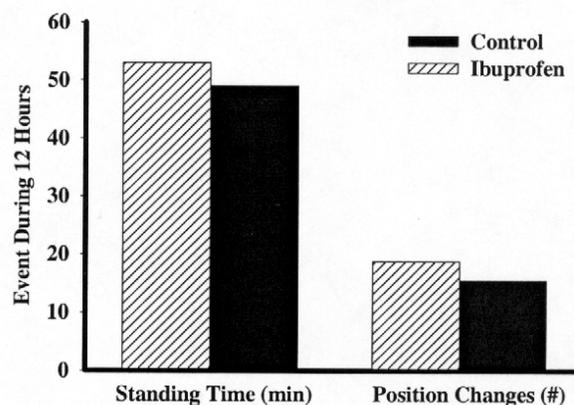


Figure 1. The mean occurrence of standing and the number of position changes during 12-h periods for 3 days post-farrowing. Position changes were defined as movements between lying and standing, as well as switches made between lying on the left or right side. Sows did not differ between treatments ($P > .50$).