The Effect of Phenylbutazone and Flunixin Meglumine on Clinical Acute Toxic Mastitis in Dairy Cows

J. J. Dascanio, *VMD*; **Gerald D. Mechor**, *DVM,MVSc*
Yrjö T. Gröhn, *DVM, MPVM, PhD*; **D. G. Kenney**,*VMD*
C. A. Booker, *DVM*; **P. Thompson**, *BVSc*
C.L. Chiffelle, *DVM*; **J.M.M. Musser**, *DVM*
L.D. Warnick, *DVM*

From the Department of Clinical Sciences, New York State College of Veterinary Medicine, Cornell University, Ithaca, NY 14853. Dr. Dascanio's present address is Virginia-Maryland Regional College of Veterinary Medicine, Department of Large Animal Clinical Sciences, Phase II, Duck Pond Drive, Blacksburg, VA 24061

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Abstract

A randomized prospective clinical trial was designed to evaluate the effectiveness of flunixin meglumine and phenylbutazone in the treatment of acute toxic mastitis in dairy cows. A total of 45 dairy cows with clinical toxic mastitis were randomly assigned to one of three treatment groups:

1. Control group - 20 cc saline I.V.
2. Flunixin meglumine group - 1 gram I.V.
3. Phenylbutazone group - 4 grams I.V.

Intravenous drug therapy was only given once at the time of initial examination with the clinician blinded to treatment. All cows were then treated four times at 12 hour intervals with 150 mg of intramammary gentamicin. Physical examination (heart rate, respiratory rate, rectal temperature, appetite, and rumen motility) and udder parameters (firmness, size, and surface temperature were assessed at initial examination and 24 hours later. Milk samples for culture and sensitivity were collected using sterile technique prior to any treatments. Additional milk samples for culture were taken 7 and 14 days after the initial presentation. Milk production was recorded at regular intervals from 1 week prior to mastitis to 10 weeks post mastitis.

Adjusting for stage of lactation, calving season, and parity, mastitic cows, compared with non-mastitic cows from the same herd, had lower milk production in the ten weeks following mastitis, particularly in the week of onset. In repeated measures models, the loss of milk associated with mastitis was not significantly different among the three treatment groups. Generally, milk production returned by 3-4 weeks following the mastitis event.

At the time of initial examination, the saline group had a higher rectal temperature than the flunixin group. At the examination 24 hours later the rectal temperatures of all treatment groups were lower than they had been at the time of the initial examination; cows on flunixin had a marginally higher temperature than did cows on phenylbutazone or saline. Similarly all groups had a significant reduction in heart rate over 24 hours. The phenylbutazone and saline groups had significantly lower heart rates at 24 hours than the flunixin group. One the phenylbutazone group had a significant reduction in respiratory rate over the 24 hour period.

The rear quarters (34/45) were more commonly affected than were front quarters. Thirty five cows returned to the herd, 9 cows were culled, and one cow died. There were no significant differences between treatment groups in the need for further treatment or outcome. Klebsiella (18/45) and Escherischia coli (16/45) were the most commonly isolated pathogens on culture of the affected quarters. Most bacteria (88%) isolated on initial examination were sensitive to gentamicin. Klebsiella and E. coli bacteria were 94% and 100% sensitive to gentamicin.

Results of this study do not suggest a benefit on milk production from the use of flunixin meglumine or phenylbutazone in cows with acute toxic mastitis. The evaluation of shorter time intervals, additional therapy with non-steroidal anti-inflammatory drugs, and the inclusion of more cows with acute toxic mastitis should be performed to more definitively elucidate the affect on milk production. Although gentamicin was in use in this herd at the time of this study, current research suggests that antibiotic therapy has questionable efficacy in these type of cows. Additionally, with current knowledge of gentamicin efficacy in acute toxic mastitis and extended withdrawal times, other antibiotics, if used, would be indicated.

This study was supported by Cornell University Alumni Unrestricted Funds.

- NOTES -

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- NOTES -

NAXCEL®

brand of ceftiofur sodium
sterile powder

For Intramuscular Use in Cattle.
This product may be used in lactating dairy cattle.

CAUTION: Federal (USA) law restricts this drug to use by or on the order of a licensed veterinarian.

INDICATIONS

NAXCEL Sterile Powder is indicated for treatment of bovine respiratory disease (shipping fever, pneumonia) associated with *Pasteurella hemolytica, Pasteurella multocida* and *Haemophilus somnus.*

DOSAGE AND ADMINISTRATION

NAXCEL Sterile Powder should be reconstituted as follows:

1 gram vial – Reconstitute with 20 mL Sterile Water for Injection or Bacteriostatic Water for Injection. Each mL of the resulting solution contains ceftiofur sodium equivalent to 50 mg ceftiofur.

4 gram vial – Reconstitute with 80 mL Sterile Water for Injection or Bacteriostatic Water for Injection. Each mL of the resulting solution contains ceftiofur sodium equivalent to 50 mg ceftiofur.

Reconstituted product should be used within 12 hours if stored at controlled room temperature or within 7 days if stored in a refrigerator (see STORAGE CONDITIONS).

NAXCEL should be administered by intramuscular injection to cattle at the dosage of 0.5 to 1.0 mg ceftiofur per pound of body weight (1-2 mL reconstituted sterile solution per 100 lb body weight). Selection of dosage (0.5 to 1.0 mg/lb) should be based on the practitioner's judgment of severity of disease, (i.e., extent of elevated body temperature, depressed physical appearance, increased respiratory rate, coughing and/or loss of appetite). Treatment should be repeated every 24 hours for a total of three treatments. Additional treatments may be given on days four and five for animals which do not show a satisfactory response (not recovered) after the initial three treatments.

CONTRAINDICATIONS

As with all drugs, the use of NAXCEL Sterile Powder is contraindicated in animals previously found to be hypersensitive to the drug.

RESIDUE WARNINGS

Neither a pre-slaughter drug withdrawal interval nor a milk discard time is required when this product is used according to label indications, dosage, and route of administration. Use of dosages in excess of those indicated or by unapproved routes of administration, such as intramammary, may result in illegal residues in tissues and/or in milk.

NOT FOR HUMAN USE
KEEP OUT OF REACH OF CHILDREN

ADVERSE REACTIONS

The use of NAXCEL Sterile Powder may result in some signs of immediate and transient local pain to the animal.

STORAGE CONDITIONS

Store unreconstituted product in a refrigerator 2°-8°C (36°-46°F).

Store reconstituted product either in a refrigerator 2°-8°C (36°-46°F) for up to 7 days or at controlled room temperature 15°-30°C (59°-86°F) for up to 12 hours.

Reconstituted NAXCEL can be frozen for up to 8 weeks without loss in potency or other chemical properties. Carefully thaw the frozen material under warm to hot running water, gently swirling the container to accelerate thawing. The frozen material may also be thawed at room temperature.

Protect from light. Color of the cake may vary from off-white to a tan color. Color does not affect potency.

HOW SUPPLIED

NAXCEL Sterile Powder is available in the following package sizes:

1 gram vial	**NDC** 0009-3362-03
4 gram vial	**NDC** 0009-3362-04

NADA #140-338, Approved by FDA

Manufactured for
The Upjohn Company, Kalamazoo, MI 49001 USA

Revised May 1991 814 055 008

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Your Solution SourceSM

The Upjohn Company, Animal Health Division
Kalamazoo, MI 49001

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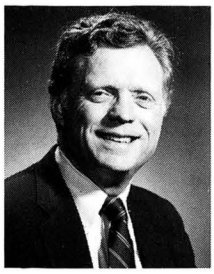
Straight Talk on Respiratory Disease:

Make your first treatment strong enough to overpower shipping fever.



Jim Van Buren, D.V.M.
Technical
Services Consultant
The Upjohn Company

The shipping fever complex (including pneumonia and bovine respiratory disease) is a widespread problem caused by a combination of bacteria, viral agents and stress. If not overpowered with proper treatment early, it can lead to relapses or chronics that can be even more costly in terms of drugs, labor and reduced feedlot performance.

Get wide-spectrum stopping power.

The shipping fever complex can be caused by one or more bacteria, including: *Pasteurella haemolytica, Pasteurella multocida* and *Haemophilus somnus.* An effective antibiotic must control all of them to head off this costly disease complex.

One antibiotic that's proven effective against the full range of these bacteria is NAXCEL® Sterile Powder (ceftiofur sodium). NAXCEL is a new generation cephalosporin that provides powerful, wide-spectrum effectiveness with no record of resistance.

A record of no resistance.

Some strains of *P. haemolytica* and *P. multocida* have shown reduced susceptibility to traditional as well as newer antibiotics. Yet continuous monitoring has shown no evidence of resistance to NAXCEL. In fact, more than 1,000 isolates have been tested without a single report of resistance.

A recent *in vitro* study gives examples of resistance to several antibiotics in comparison to NAXCEL. The study included 156 isolates of *P. haemolytica* and *P. multocida* collected during the 1990-91 pneumonia season from across the country.

Resistance of *P. haemolytica* and *P. multocida* isolates to comparable antibiotics.*

Antibiotic	*P. haemolytica* % Resistance	*P. multocida* % Resistance
Ampicillin	54.1	12.7
Ceftiofur sodium (NAXCEL)	0.0	0.0
Erythromycin	100.0	92.9
Sulfamethazine	89.4	77.5
Tetracycline	51.8	36.7
Tilmicosin	9.5	22.4

Note that in addition to the resistance shown for traditional antibiotics, resistance to tilmicosin (a newer antibiotic) was also demonstrated.

*Data available upon request.

Profit from cost-effective control.

Getting cattle healthy and back on feed sooner is always more cost effective than re-treating chronics or relapsed cattle. Wide-spectrum effectiveness with lack of resistance make NAXCEL a wise first choice for cost-effective treatment. Using NAXCEL is also more economical than combining two or more antibiotics.

Make safe, effective therapy your first choice.

NAXCEL has also demonstrated powerful results with less stress on sick animals. Its low dosage (as little as 1 mL per 100 pounds of body weight) means there's no need for multiple injection sites that are required by larger doses of other treatments.

What's more, slaughter checks have shown no tissue irritation with NAXCEL. That's an important advantage in meeting today's demand for quality beef.

There's also no pre-slaughter withdrawal period to interfere with cattle marketing plans when NAXCEL is used according to label directions.

NAXCEL has what it takes to meet today's stringent food safety guidelines while effectively treating shipping fever. By controlling a full range of bacteria, NAXCEL gives cattle a healthy chance of overcoming infections and poor performance. And all these qualities continue to make NAXCEL the first-choice solution for shipping fever.

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Your Solution Source℠

The Upjohn Company, Animal Health Division
Kalamazoo, MI 49001

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