

THE TREATMENT OF CLINICAL MASTITIS

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There is made a clear distinction between the treatment of **Acute Clinical Mastitis** and **Chronical Clinical Mastitis** in the following.

Definitions:

Acute Clinical Mastitis:

A sudden occurrence of mastitis with the typical acute symptoms such as tumour, rubor, calor & dolor, as well as functio laeae in many cases. There is not taken into consideration if the infection itself is old (exacerbative mastitis) or new. Knowledge concerning the time of infection will naturally be taken into account before treatment.

Chronical Clinical Mastitis

A form of mastitis without a manifestation of the typical acute symptoms for the cow, but naturally, enough to be able to be revealed as changes in appearance, smell or taste as well as a simple cow-side tests such as tybromolpaper, CMT- test or conductivity.

Treatment:

Acute Clinical Mastitis:

The main objective of the treatment should be directed at relieving pain for the cow, which is directly caused by the inflamed quarter.

1. An intravenous injection of oxytocin and a thorough milking should be the first step.
2. The cow's general state of health should be assessed directed towards signs of intoxication.
 - a. If there are no signs of intoxication, then go to Point 7.
 - b. If there are signs of intoxication then a concentrated salt-water solution of 4-5 ml/kg. body weight should be administered.
 - c. It is important to also offer the cow water from a bucket during and after the administration as well as 20 % glucose at a dosage of 500ml i/v.
3. A NSAID's or a glucocorticoid preparation should also be administered to reduce swelling and relief pain.
4. In cases of extreme expressions of pain an epidural analgesic should be administered
Dosage per 600 kg. body weight: Xylazin 20 mg/ml: 1 ml, morphine 20ml/ml: 1,5ml in NaCl 0,9% ad 10ml)

5. Go to Point 7. if there is a suspicion of a gram-positive bacteria.

6. In case of suspected gram-negative bacteria

- a. There is often a dramatic reduction of the daily milk yield typically from 20-30 l. to 1-2 l.
- b. There is often a complete loss of appetite.
- c. Often infections in cows with a preceding low SCC – which is a sign of an acute infection in the quarter.
- d. The temperature of the skin on the pelvis will be cold.
- e. Often diarrhoea.
- f. There can often be a steep rise in body temperature during the first 12-14 hours of the infection, but with the appearance of clinical symptoms the infection will typically be 10-12 timer old and the body temperature will be sub-normal.
- g. In the first hours of the infection the milk will be thin and watery (with flow patterns).
In the more serious cases of gram negative infections the milk will change to a serous fase after
12-14 hours.
- h. After about 12-14 hours (2-6 hours after the appearance of clinical symptoms) in milder cases there will be an incipient reduction of the swelling of the quarter and the appearance of the milk will be dominated by large clots, later changing to a junket-like consistence.
- i. If the clinical examination reveals some of the points a. to h., it can be an indication to treat the cow intravenously with calcium.
- j. At this point it should be decided if the preliminary treatment with liquids should be followed up with an intravenous administration of several litres of an isotonic solution.
- k. Although milder infections often do not need antibiotics there should according to the severity of the infection be chosen a suitable intramammary antibiotic in the cephalosporin group (until now the only one with a documented effect against gram negative infections of the udder) In more serious cases there should be treated universally with e.g. ampicillin or amoxicillin. A third choice could be sulfa/trimethoprim.

7. If the introductory examination does not indicate an intoxication or where there is an intoxication as a result of a strong infection and pain from the udder, but without the characteristic gram negative symptoms as mentioned at point 6, it should be presumed that the cow is suffering from a gram-positive infection.

- a. Universal antibiotic treatment: penicillinprokain or penethamat
- b. Local antibiotic treatment: intramammary treatment with a combination preparation with penicillinprokain and streptomycin. (“pure” intramammary penicillin is not at the moment available in Denmark).

8. In certain herds, frequent occurrences of penicillin resistant staphylococcus can make it necessary to administer spiramycin or sulfa/trimethoprim universally and intramammary neomycin already with the initial treatment These products can be indicated in cases of teat lesions that can be the cause of mixed infections by pyogenes or a change in the smell of the milk, that can suggest a pyogenes infection.

9. Even if there it is a case of a probable gram-positive infection, treatment for pain as mentioned under Point 3 should be seriously considered.

10. A milk sample should be taken after a thorough disinfect ion of the teat.

Supplementary Treatment of Acute Clinical Mastitis

Regardless of the results of the bacteriological culture, it should be the degree of the intoxication and the inflammation that decide the course of the supplementary treatment with liquids and pain treatment every 12-24 hours, until the inflammation is under control

Supplementary treatment will be based mainly upon the clinical finds at the first treatment compared with the results of the culture and the clinical finds at the second examination.

In cases of gram-negative infections it can be relevant to continue intramammary treatment once or twice every 12 hours. In nearly all cases the infections will be so mild that supplementary treatment is not necessary. In these cases the inflammation will often be completely gone at the second examination 12 hours after the start of the first treatment. In cases with a persistent strong inflammation and a completely serøst or bloody secretion with evt.air a continued systemic treatment for 2-3 days will be necessary to prevent a possible septicaemia.

In cases of gram positive infections it will be necessary continue treatment with penicillinprokain or penethamat as well as intramammary treatment with a combined preparation of penicillinprokain and streptomycin for 3 days with finds of **streptococcus** and for 5 days with finds of **penicillin sensitive stafylococcus**. In cases of **penicillin resistant staphylococcus** the treatment should be continued for 5 days with spiramycin or sulfa/trimethoprim universally and intramammary neomycin.

In cases of **yeast infections** known antibiotics will have no effect, continued treatment should therefore consist of symptomatic treatment for inflammation such as frequent milking.

In cases of **actinomyces pyogenes** will it often be impossible to cure or improve the condition of the quarter. Antibiotic treatment for inflammation should only be continued as long as the cow has pain in the udder and until the normal state of health is achieved again.

Chronical Clinical Mastitis

As defined in the beginning this form of mastitis has no typical symptoms of inflammation, treatment can therefore wait until there is a result from the laboratory culture.

Frequent and thorough milking is an important factor in the treatment of this kind of mastitis.

If it is possible using the cow as a "nurse cow" for 2-3 weeks is a useful solution. According to the yield of the cow, 1-4 calves that are used to suckle, will be necessary to achieve a good milking effect. In herds with Johne's disease it is important to take special precautions according to the development of the disease in the herd.

Another possibility is to treat the cow with oxytocin (to ensure an effective emptying of the quarter) before each milking for 3-5 days, eventually in connection with an antibiotic treatment.

Treatment with antibiotics

During the clinical examination of the cow it is important to assess the prognosis for an eventual treatment. Particular consideration should be given to previous treatment, previous SCC from Milk Recording, the condition of the udder and the teat orifices and atrophy or induration in areas of the udder.

In cases of gram-positive infections it will be relevant to administer penicillinprokain or penethamat universally as well as a combination preparation with intramammary penicillinprokain and streptomycin for 3 days with finds of streptococcus, and for 5 days with finds of **penicillin sensitive staphylococcus**. **Penicillin resistant staphylococcus** should be treated for 5 days with spiramycin or sulfa/trimethoprim universally and intramammary neomycin.

In cases of yeast infections known antibiotics will have no effect. The only treatment that can be recommended is frequent milking.

In cases of acitinomyces pyogenes in an udder with an unchanged condition and normal teats, it is worth trying treatment with antibiotics to prevent an outbreak of mastitis.

In a very few cases **gram-negative infections** can be the cause of mastitis. To verify a positive find of **pure gram negative bacteria** in a laboratory culture and eliminate the possibility of a short term coincidental infection or contamination, the analysis should be repeated once or twice before antibiotic treatment is initiated. Treatment should consist of intramammary celphalosporin for 3-5 days.

In combating chronical mastitis it is important to keep accurate records concerning all finds of udder infections in the herd. All treatments and results of bacteriological examinations should be meticulously noted. If the cow is to stay in the herd, these records will make an effective dry- cow therapy much easier.