

Treatment of bovine sub-clinical mastitis with homeopathic remedies

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Abstract

Considering the positive results of homeopathic therapy of bovine mastitis, the presented study should evaluate the effects of two standardized homeopathic methods in sub-clinical mastitis using a prospective randomized double-blind placebo control study design. A number of 124 dairy cows from 17 herds with increased somatic cell count were selected and randomly associated to 5 treatment groups. Two groups received a peroral therapy with (a) a homeopathic combination over 5 days and (b) a single treatment with a homeopathic nosode (Tuberculinum). To each treatment group a placebo control group was established with the same treatment frequency. A fifth group served as an untreated control. The bacteriological cure rate after 4 and 8 weeks was 28% and the total cure rate additionally regarding a normalized somatic cell count was 14% and 18%, respectively. There was no significant effect by the remedies at all. The cow somatic cell count over three months after treatment showed no significant difference in the five groups. Standardized homeopathic combinations and Tuberculinum nosodes are not able to control sub-clinical mastitis during lactation. If other factors like age and microbial agent are responsible for the success of homeopathy or if more individualized protocols provide better results has to be answered in further investigations.

Introduction

Mastitis is the most common health problem in Swiss organic dairy herds. The regulations and consumer presumptions claim a minimal chemo-therapeutic intake to control udder health although antibiotics are very effective under certain conditions. On the other hand there are existing problematic mastitis causing micro-organisms which are resistant to antibiotics. Thus, the preferred complementary treatment methods in organic dairy farms are an important research field for alternatives in conventional mastitis control, too. There are three areas of therapeutic mastitis control strategies, (a) therapy of acute clinical mastitis, (b) therapy of chronic and sub-clinical mastitis and (c) prophylaxis at drying off. Besides a huge potential of self-cure and physical methods like milking-out and cooling ointments, homeopathically supported treatment of acute mastitis could provide satisfying results (Klocke et al., 2004; Klocke et al., 2000; Merck et al., 1989). Dry-off therapy (prophylaxis) in conventional herds is commonly conducted by intra-mammary application of long-term antibiotics to (a) treat sub-clinical mastitis and (b) prevent for new infections during the critical dry time. Alternatives like teat sealants has been established as a hopeful concept to close the teat ends and prevent environmental microbial invasion (Woolford et al., 1998), but did not always lead to the required effects (Klocke et al., 2006). Homeopathy based dry-off concepts only provided satisfying results in the prevention against certain micro-organisms (Klocke et al., 2006) or in combination with antibiotics (Klocke et al., 2000). Preventive effects by using so-called "homeopathic nosodes" produced by potentized

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microbial cultures or other pathologic secretions are very limited (Barlow et al., 2001; Fidelak et al., 2007). However, the treatment of sub-clinical mastitis during lactation is an uncommon concept because of the sub-sequent withdrawal time after antibiotics. Thus, the idea of using residual-free agents like homeopathics during lactation could be an acceptable method to avoid additional costs and provide an alternative to the discontenting period of rest between sub-clinical mastitis detection and dry-off. Although there is no evidence of effectiveness of these concepts (Egan, 1995), there is a huge gap of knowledge on this field. The prospect of a cheap additional mastitis control concept especially for organic farmers justifies further research about this. Consequently, in this presentation two common concepts should be evaluated in terms of their effects in case of sub-clinical mastitis on subsequent somatic cell count (cow level) and infection state (quarter level) hypothetically expecting a higher cure rate on quarter level in the verum groups compared to the other and a significant lower somatic cell count on cow level during the observation period of 3 months.

Materials and methods

From a national swiss udder health improvement project network a number of 17 recently recruited organic dairy herds with identified sub-clinical mastitis problems were chosen for the investigation. In these herd a total number of 150 cows were selected which matched the following criteria: (a) monthly recorded somatic cell count beyond 100'000 cells/ml for 3 subsequent times or continuing after calving, (b) no sensory aberrations of milk or udder tissue, (c) no acute or reconvalescent udder or teat injuries. A number of 125 cows matched all these criteria. After cow selection a randomization of trial cows for each farm was conducted and the cows were classified in 5 treatment groups as shown in table 1.

Tab. 1: Treatment group definition and treatment protocols

Group	Remedy and dilution	Treatment protocol
H	Combination of Calcarea carbonica D30 & Phosphorus D15 & Pulsatilla pratensis D6 & Atropa Belladonna D6 & Lac vaccae D60	Peroral treatment of 10 globuli diluted in 5 ml tap water for 5 days
N	Nosode: Tuberculinum Koch C30	Peroral treatment of 10 globuli diluted in 5 ml tap water one-time
C_H	Corresponding placebo to Group H	Like in group H
C_N	Corresponding placebo to group N	Like in group N
U	Untreated control group	-

The group H was treated with remedies as recommended especially for bio-dyn farms (Spranger and Walkenhorst, 2006).

Before treatment quarter milk samples for bacteriological and cell count investigations were taken and repeated approx. 4 (C1) and 8 (C2) weeks after treatment. The results of the quarter findings were categorized in (a) not suspicious quarters with no positive cultural findings and somatic cell count (SCC) below 100'000/ml, (b) cell count elevated quarters with no cultural findings and cell counts >100'000/ml and (c) sub-clinically infected quarters with > 100'000 SCC and cultural positive results. The basic laboratory results were compared to those of the control samples. The bacterial cure rate (BCR) was calculated as the number of quarters with no bacteriologic positive

results in the respective control investigation by all treated quarters, the total cure rate (TCR) represented the bacteriologically cured quarters with normal somatic cell counts <100.000/ml. The cure rate comparison was analysed by using a univariate logistic regression model with the independent variable "treatment group" with 5 levels. Milk records of monthly routine milk test data were documented over 3 months before (T-3 to T-1) and after (T1 to T3) treatment and the logarithmic transformed somatic cell counts (Linear Score) were compared to the mean of cell counts 3 months before treatment or from calving to treatment using ANOVA analysis. The general significance level was set to $\alpha=0.05$. All data analysed by the statistic software package JMP (SAS institute).

Results

A total number of 124 cows entered the study. After laboratory investigation a number of 84 cows (149 quarters) were assessed as sub-clinically infected, all other cows showed only a cell count increase (n=31) or normal secretion (n=9). On cow level the bacteriological cure rate (10.7 and 4.8% in control investigation 1 and 2, resp.) and the total cure rate (2.4 and 4.8%, resp.) was poor in all treatment groups (see table 3) for both control investigations. There was no effect by the verum therapy on cow level at all. Quarters in the Nosode control group showed a significant higher Cure rate in the first control investigation compared to untreated control.

Tab. 2: Data of quarter bacteriological cure rates (BCR) and total cure rates (TCR) in the control investigations C1 and C2.

Parameters	Treatment Group					Total
	H	N	C _H	C _N	U	
# cows	25	24	24	26	25	124
# quarters	100	96	96	104	100	496
# subclinical infections	34	33	32	26	24	149
BCR C1 (4 wks)	35% ^a (n=12)	27% ^a (n=9)	16% ^a (n=5)	42% ^b (n=11)	17% ^a (n=4)	28% (n=41)
BCR C2 (8 wks)	41% ^a (n=14)	24% ^a (n=8)	19% ^a (n=6)	31% ^a (n=8)	25% ^a (n=6)	28% (n=42)
TCR C1 (4 wks)	12% ^a (n=4)	12% ^a (n=4)	3% ^a (n=1)	31% ^b (n=8)	4% ^a (n=1)	12% (n=18)
TCR C2 (8 wks)	24% ^a (n=8)	12% ^a (n=4)	6% ^a (n=2)	19% ^a (n=5)	17% ^a (n=4)	15% (n=23)

Values with different superscripts a,b within one line are significantly different with $p<0.05$ compared to untreated control in the logistic regression

As seen in Figure 1 there is no effect on the somatic cell count after treatment. All 5 groups showed a stabilizing effect compared to development of SCC in the three months before treatment.

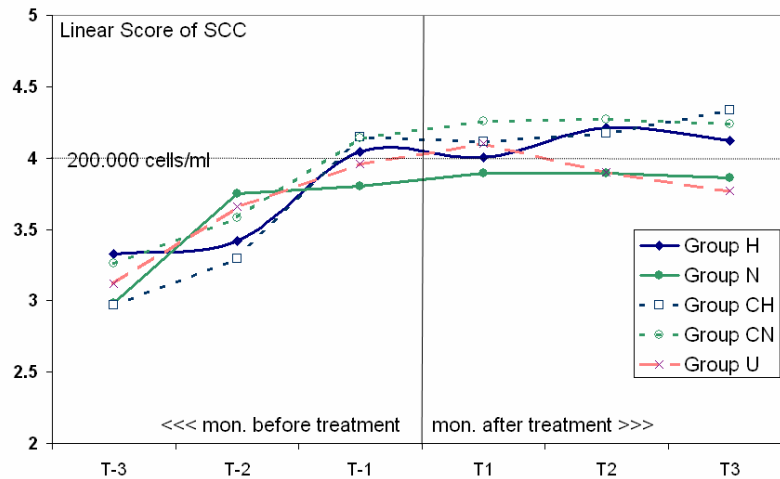


Figure 1: Logarithmically transformed somatic cell counts of cows three months before and three months after treatment in the five treatment groups; standard deviations not shown due to clearness.

Discussion & Conclusions

In general there are no beneficial effects after the treatment with combined homeopathics and the tuberculinum nosode on sub-clinical mastitis. It has to be analysed if there are differences of treatment success depending on species or other factors like age and farm. It has to be analysed if classical homeopathic methods or other remedies are able to provide better results. On the other hand, taking into account the results of other studies, the prognosis of cure sub-clinical mastitis is poor. Anyway, the hypothesis of efficient treatment with the presented remedies has to be rejected.

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