

## Relationship between subclinical post partum mammary inflammation, neonatal mortality and puppies growth in dogs

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Subclinical canine mastitis has not been yet studied in detail. Neither its prevalence nor its impact on puppies' growth have ever been explored [2]. Detection of mastitis in other species is based on somatic cell counts, especially milk polymorphonuclear cell (PMN) count as an indicator of inflammation [1]. The objectives of this work were first to test an easy-to-use method of PMNs counting in bitch milk and to evaluate the relationship between mammary inflammation and puppies' health (neonatal mortality and weight loss). At Day 3 post partum, 422 milk samples were collected from 50 bitches freely suckled by their offspring (mean=8.5 mammary glands sampled/bitch) in a multibreed kennel. 25 µl from each sample were smeared on a microscope slide and stained (Giemsa). Among all samples, 256 were then centrifuged (3000g, 5 min) and a second smear was performed and stained (Giemsa). The number of PMNs per microscopic field [NN] was counted from 20 fields per slide. 282 puppies were born from these bitches and followed from birth to Day 21. Growth was expressed as Average Daily Gain between birth and Day 7 as a percentage of birth weight (% ADG D0-D7=Weight D7-Weight D0/7\*Weight D0). Total mortality between birth and D21 was registered. Since the correlation between [NN] on full-fat milk and skimmed milk was so low ( $p<0.001$ ;  $r^2=0.15$ ), only full-fat milk smears were used in the study. The median [NN] per mammary gland was 2 (interquartile range IQR0;4) (range: 0-261). 29.4 % of milks had no PMN and 79.1% had less than 5 PMNs. [NN] was not found influenced by mammary gland position (M1 to M5; M1 pair to M5 pair; right or left) (respectively  $p=0.31$ ,  $p=0.73$ ,  $p=0.7$ ). The median [NN] per bitch was 2.7 (IQR1.6;4.7) (range: 0.1-49). From the distribution of the data, the threshold defining a mastitis was set at 10 (value of the ninth decile), inducing a prevalence of 10.7%. From a qualitative point of view (mastitis vs healthy), no significant difference was highlighted between the right and left mammary chains, between the pairs of glands or the gland position (respectively  $p=0.7$ ,  $p=0.7$ ,  $p=0.3$ ). 12% of the bitches showed at least one inflammatory gland. 23% of puppies born alive died between D0 and D21. The number of litters from which at least one puppy died between D3 and D7 was compared between bitches having at least one inflammatory gland or not. Mammary inflammation only tended to be associated with neonatal mortality between D3 and D7 ( $p=0.059$ ) and there was no correlation between mortality between D0 and D2 and the presence of one inflammatory gland ( $p=0.5$ ). Also, mortality between D0 and D7 was not correlated with the mean [NN] per bitch ( $p=0.6$ ). Growth rate over the first 7 days [% ADG D0-D7] per litter was not modified by the presence of one inflammatory gland in the bitch ( $p=0.4$ ). This study evidenced the high variability of mammary inflammation both between bitches and also between glands per bitch. It demonstrated that it tends to be associated with neonatal mortality but not with puppies' growth, probably because puppies don't appropriate one teat and most of the bitches have only one inflammatory gland. In future studies, it will be interesting to investigate the differential leucocyte type (mature and immature neutrophils, lymphocytes and monocytes, eosinophils and basophils) and to follow the spontaneous evolution of milk cytology over the whole lactation

[1] Ververidis HN, Mavrogianni VS, Fragkou IA et al. Veterinary Microbiology 2007; 124:95-106.

[2] Viguier C, Arona S, Gilmartin N et al. Trends in Biotechnology 2009; 27:486-493.

# ABSTRACT BOOK

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