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Mastitis in lactating bitches

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Mastitis is a significant disease of lactating bitches, with serious implications for the welfare of affected animals, as well as of their puppies. This short review presents an update of the disease. Mastitis is caused most often by *Escherichia coli*, *Staphylococcus* spp. (*S. aureus*, *S. pseudintermedius*, coagulase-negative Staphylococci) or *Streptococcus* spp.. The disease develops in one or more mammary glands of lactating bitches, more frequently immediately after death or weaning of puppies during mammary involution. Bacteria enter into the mammary glands usually through the teat duct; the possibility of mammary infection through scratches or injuries of the skin or even haematogenously has also been reported. Predisposing factors include inappropriate environment, mammary congestion, teat injuries, small litter size, removal of puppies, severe stress and presence of metritis. The disease has acute course and can be life-threatening. General condition of affected animals changes; the bitches develop inappetance, restlessness, fever and indifference for their puppies. Affected mammary glands are painful, hot, enlarged and/or oedematous. Mammary secretion becomes thick, yellow, green, red or brownish and contains flakes or clots. Abscesses may develop in the parenchyma of the affected mammary glands. Necrosis can also occur, leading to sloughing off part of the parenchyma. In long-standing or subclinical cases of mastitis, no striking clinical signs are evident. One may suspect subclinical mastitis, if puppies do not appear to suck often, look hungry and do not thrive. In long-standing mastitis, the mammary gland can appear shrunken. In other cases, fibrous tissue can develop in the affected mammary glands and can be palpated as small hard nodules, which may lead to recrudescence of acute clinical disease in the subsequent lactation or in cases of pseudopregnancy. Blood leucocyte counts increase, whilst thrombocyte counts may decrease. Gross pathological findings include congestion, purulent discharge and subcutaneous oedema at early stages of the disease, which are followed by abscessation and decrease of size of the gland. Salient histopathological features are initially neutrophilic infiltration, haemorrhages, destruction of mammary epithelial cells and alveoli, and, at later stages, infiltration by lymphocytes, shrunken alveoli, loss of glandular architecture and fibrous tissue proliferation. Diagnosis of clinical mastitis is based on the signs; differentials of acute mastitis include galactostasis, injuries and dermatitis in the area of the mammary glands and of chronic mastitis include inflammatory-type mammary tumours. Bacteriological examination of mammary secretion is used to isolate and identify the aetiological agent, which helps to choose antimicrobial drug for treatment. For diagnosis of subclinical mastitis, the only reliable method is the combination of bacteriological and cytological examination. For the latter, Whiteside test (for evaluation of clot formation) and Giemsa stain (for identification of leucocyte subpopulations) in milk samples are used. Treatment should start immediately after diagnosis, by administration of antimicrobial agents for 7-10 days, based on results of microbiological examination of mammary secretion. One should also consider that antibiotics excreted in milk, can be uptaken by puppies; hence, administration of tetracyclines, fluoroquinolones and chloramphenicol is contra-indicated. For selection of appropriate antibiotics, the aetiological agent of the disease and the results of susceptibility testing should be taken into account. Non-steroid anti-inflammatory drugs may be used as adjunct to the antimicrobial treatment. If systemic signs are present, general support of the animal should be provided. Treatment also includes care of puppies of the affected bitch. In cases of mild mastitis, in which composition of milk has not been altered and the general condition of health of the bitch would allow, newborns may suck their dam normally.

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