

CANINE MEIBOMETRY: ESTABLISHING BASELINE VALUES FOR MEIBOMIAN GLAND SECRETION IN DOGS

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ABSTRACT

The maintenance of ocular surface health depends on the tear film which consists of superficial, intermediate and deep layers. The superficial lipid layer, the meibomium, is secreted from the tarsal glands, and provides a thin, oily covering over the aqueous layer. Its function is to retard tear evaporation. Keratoconjunctivitis sicca (KCS) is a common eye problem in dogs. The disorder is characterized by an aqueous tear deficiency which results in desiccation, hypoxia and inflammation of the conjunctiva and cornea. This condition leads to a progressive ocular disease and may also reduce vision.

Abnormalities in any tear film component may alter tear dynamics and compromise tear function. To date there have been no studies quantifying the meibomian gland secretions in the dog, though low meibomium levels may play an important role in the pathogenesis of KCS, by increasing tear evaporation. The aim of our study was to evaluate an instrument designed to measure the meibomium levels in dogs and to obtain baseline values for the normal canine eye. The Meibometer (Courage + Khazaka, Koln, Germany) is a simple, non-invasive instrument used in human ophthalmology to quantify the meibomium level. Meibometry was conducted on 42 dogs (24 females, 18 males), of mean age 3.7±2.9 years (2 months to 10 years). Of the 42 dogs, 16 were Miniature Schnauzers, 5 were Long-haired Dachshunds and the rest were various inbred or mixed breed dogs.

The test was conducted by imprinting a plastic loop against the lower eyelid margin of both eyes (the first eye tested was chosen randomly), and reading the change in optical transmission resulting from the blot of oil. Following meibometry, Schirmer Tear Test (STT) was conducted in both eyes using a commercial tear strip (Schering-Plough Animal Health) to quantify the aqueous layer of the tear film. The mean meibomian level of the 84 canine eyes was 179±60 meibometry units (MU) and the mean STT was 21.3±5.1 mm/min. Meibometry results were significantly affected by breed. Miniature Schnauzers had significantly lower meibometry readings (P=0.04 for the left eye, P=0.001 for the right eye), with mean meibometry results of 149±48 MU compared to 199±59 MU in the other breeds. The STT results were not significantly affected by sex or age, and there was no correlation between the STT and meibometry results. The Miniature Schnauzer is a breed with a predisposition for KCS. Our results indicate that their low meibomian lipid levels could make them susceptible to KCS due to increased tear evaporation. Meibometry is a simple and non-invasive technique that may contribute to our understanding of the pathophysiology of some forms of KCS, their diagnosis and treatment.

Keywords:

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