ABSTRACT

Cataracts as a consequence of chronic diabetes is a considered a leading cause of legal blindness worldwide with a substantial health impact. The prevalence of cataracts is linked to the age of onset of diabetes. Methods: Objective: Assess post-induction (PI) onset of clinical ocular cataract(s) in colony of diabetic miniature swine (DMS). Animals: 38 adult diabetic Yucatan miniswine (Molina, 2009; 266 castrated, male, diabetic, Yucatan miniature swine). Method: Diabetic miniswine were routinely screened by the veterinary staff for clinical ocular abnormalities indicating cataract, based on a four week period. Results: Over the course of a four month period, the prevalence was 10% (38 positive animals out of the 384 animals) for cataracts. The mean onset time was 2.5 months (3.0 with 0.95 confidence interval) post induction. Diet was not related to the onset of cataracts in any animal. Conclusions: A cataract is an opacification or clouding of the lens inside the eye which leads to a decrease in vision. Visual loss occurs because opacification of the lens obstructs light from passing and being focused on to the retina at the back of the eye. Light is scattered such that the image becomes blurred or ‘fuzzy’. The result is a loss of acuity and visual handicap. Visual handicap often results in the need for glasses or other forms of vision correction or other therapeutic drugs for preventing or treating cataracts.

RESULTS

Prevalence of cataracts over a 2.5-month period was recorded (Table 1). The distribution by eye for each cataract was equivalent. Figure 2 illustrates the distribution of time of onset of cataract in months post-induction. The range was from 1.0 to 19.0 months post-induction. Figure 3 demonstrates a representative case of diabetic cataracts. The glial structure presented has normal findings. Figure 3 for this animal shows the anterior lens in its normal form. Cataract is a hyperplasia of the lens cells, which are normally transparent and blue; it is a gelatinous mass. Visual loss occurs because light is scattered in all directions, and the image becomes blurred or fuzzy. The result is a loss of acuity and visual handicap. Visual handicap often results in the need for glasses or other forms of vision correction or other therapeutic drugs for preventing or treating cataracts. Conclusions: Diabetic Yucatan miniswine are commonly maintained with cataracts on average of 11 months post-induction. Insulin regimen and glucose control are strong factors in the prevalence and incidence of cataracts in diabetic miniswine. Our data demonstrates a correlation between the prevalence of cataracts and increased glucose control. This model of diabetes in diabetic animals with non-optimal glucose control in addition to the diabetic miniswine would provide a good model for preventive or therapeutic cataract therapies.  

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