Refined method of Tropicamide application in minipigs

KEAL GRACEY

Labcorp Early Development Laboratories Ltd

Correspondence: keal.gracey@labcorp.com

Introduction

- Tropicamide is supplied as a 1% solution in a sealed bottle with a dropper lid. This is a short-acting anticholinergic agent used to induce dilation of the pupil.
- Pupil dilation is required to facilitate ophthalmoscopy examinations.
- Ophthalmoscopy examinations are carried out in drug development trials to detect any abnormalities within the eyes at defined stages of a study.
- Assessments include a comprehensive examination of the globe structures (e.g. cornea, anterior chamber, lens and ocular fundus) by using binocular indirect ophthalmoscope and/or slit lamp.
- The current method of application is with a dropper bottle. However this can be difficult in pigs because it is not possible to manoevre the head in the way required to allow drops to fall into the eye (Figure 1).

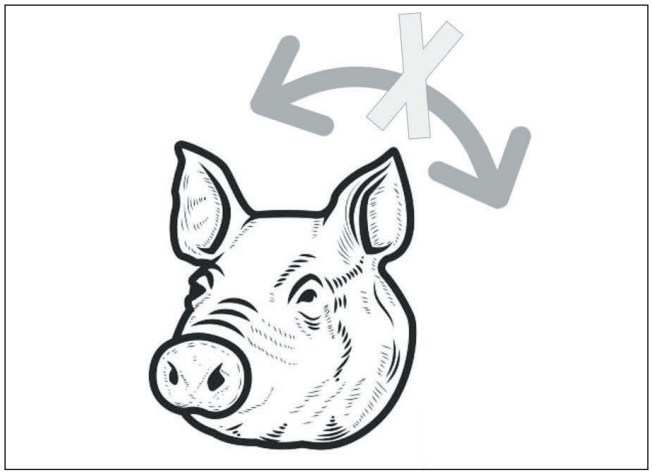

Figure 1. Movement restrictions of pigs.

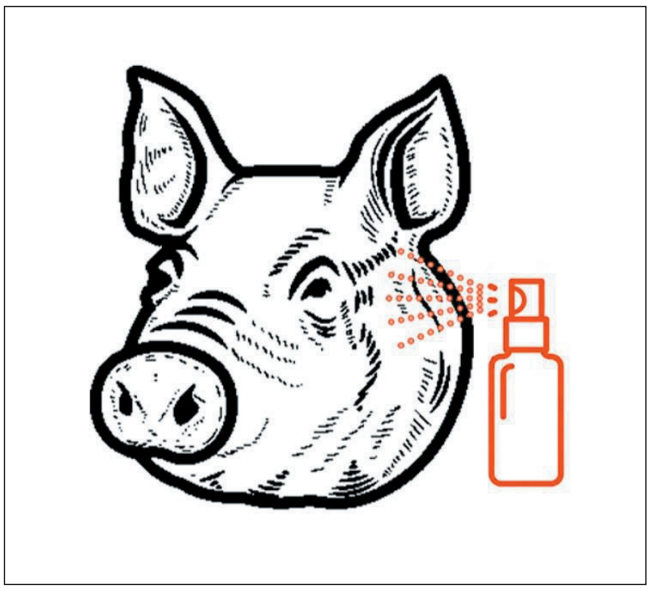

Figure 2. Spray application of Tropicamide.

- When administered via dropper method, animals often exhibit signs of discomfort, such as head thrashing and vocalisation, while the technician attempts to steady the head in order to get close enough to the eye to instill the drop.
- A new method of application has been developed to streamline the process of Tropicamide application making it easier for technicians and animals. The new process allows Tropicamide to be sprayed onto the eye, eliminating the need for the head to be manoevred (Figure 2).
- There is a lack of research into the application of Tropicamide via spray in pigs in a preclinical setting. Research in humans however showed that the spray application is a viable method.[1]

Objective

The objective of this experiment was to investigate the efficacy of Tropicamide when administered using a new spray method.

Materials and methods

- The study design was to compare pupil dilation across 2 administration methods (spray vs. drop).
- A pump-action spray, specifically designed for ophthalmic use, replaced the removable dropper on the bottle of Tropicamide.
- 30 animals were allocated to one of 3 separate groups. Each group (A/B/C) was allocated a different application method: A) One drop in both eyes, B) One drop in the left eye and one spray in the right eye, or C) One spray in both eyes.
- A second and third round of investigations took place wherein two sets of 30 animals were administered Tropicamide using only the spray method.
- Human data showed that spray application was effective on open or closed eyes;[2] as such, whether the animal's eyelid was open or closed upon spray application was recorded at all occasions.
- Animals were held by a competent handler as shown in Figure 3, with the front legs placed over the handler's arms.
- The administering technician directed the spray nozzle towards the animal's eye and pressed down once on the spray pump (Figure 2).
- The handler then turned to show the administering technician the other side of the animal's head and the process was repeated (Figure 4).

Figure 3. Handling of animals with front legs placed over handler's arms.

Figure 4. Handling of animals with front legs placed over handler's arms (from behind).

- It was not necessary to manipulate the animal's head or to turn the animal around in the handler's arms.
- The method of Tropicamide application was unknown to the veterinarian that performed the ophthalmology examinations.
- Whether or not the pupil was sufficiently dilated for examination was recorded.
- The animal was returned to the home pen and rewarded with a small edible treat (Figure 5).

Figure 5. Small edible treat given after Tropicamide application.

Conclusions

The spray application method of Tropicamide administration was successful in all cases. The method worked on open or closed eyes and the time taken to complete the procedure was reduced considerably. The revised method had a positive impact on Animal Welfare and proved to be considerably easier for technicians, handlers and the animals involved.

References

1 **Bartlett, J.D., Wesson, M.D., Swiatocha, J., *et al.*** (1993). Efficacy of a pediatric cycloplegic administered as a spray. J Am Optometric Association; 64(9):617-21.

2 **Portes A, Barbosa A, de Mello G, *et al.*** (2012). Tropicamide 1% Mydriatic Effect: Comparison Between Spray in Closed Eyes and Eye Drops in Open Eyes. J Ocular Pharmacol Thera; 28(6):632-635.

Introduction to the Mental Health First Aid (MHFA)

We are aware of an increasing pressure on Animal Techs within the industry and we are delighted to share a new initiative from the IAT Equality, Diversity and Inclusion group led by Haley Daniels.

Mental health problems can affect any of us at any time. One in four of us will experience a mental ill-health at some point in our lives and this increases amongst people in caring professions. Anxiety, stress and depression are the most common mental health struggles and can lead to other health issues.

If you are experiencing any of these issues and you feel that you would benefit from a one-to-one chat, the IAT have a group of people all with experience of Animal Technology, all of whom who are mental health first aid trained. Via the IAT members' website and using this QR Code – you can request a confidential and unbiased conversation with any of the mental health first aiders who will be able to listen and guide you to seek further assistance if required.

MHFA Request