

Experiment no. 9

Aim: Effects of Drugs on Rabbit Eye

References

1. Goodman & Gilman's: *The Pharmacological Basis of Therapeutics*
2. Dey, S., & Chatterjee, R. (Eds.). (2015). *Handbook of Experimental Pharmacology*. Springer.

Objective

To study and compare the ocular effects of various drugs, including changes in pupil size, intraocular pressure, and corneal reflex in rabbits.

Materials Required

- Healthy adult rabbits (e.g., New Zealand White strain)
- Test drugs: Pilocarpine, Atropine, Adrenaline, Timolol
- Control: Normal saline (sterile)
- Tonometer (for measuring IOP)
- Calipers or millimeter ruler (for pupil size)
- Ophthalmoscope (for detailed examination)
- Stopwatch
- Cotton swabs (for corneal reflex testing)
- Anesthetics (if necessary)
- PPE (gloves, lab coat, goggles)
- Data recording sheets

Experimental Methodology

1. Animal Preparation: Acclimate rabbits to the lab environment for at least 1 hour. Place each rabbit in a comfortable restraining device to minimize movement.

2. Baseline Assessment: Measure and record the baseline pupil diameter and IOP of both eyes. Evaluate corneal reflex by gently touching the cornea with a cotton swab.

3. Drug Administration: Instill one drop of the selected drug into the right eye. Instill one drop of normal saline into the left eye (control).

4. Observations: Record pupil size and intraocular pressure at intervals of 5, 10, 20, 30, and 60 minutes post-administration. Document any change in corneal reflex and other signs (e.g., redness, tearing).

5. Post-Experiment Care: Monitor rabbits for full recovery from any drug or anesthetic effects. Provide proper animal care and housing following ethical guidelines.

Sample Data Table (Using Pilocarpine as Test Drug)

| Time (min) | Pupil Size (mm) | Intraocular Pressure (mmHg) | Corneal Reflex | Additional Observations |
|------------|-----------------|-----------------------------|----------------|-------------------------|
| | Right | Left | Right | Left |
| Baseline | 5.0 | 5.0 | 18 | 18 |
| 5 | 3.0 | 5.0 | 16 | 18 |
| 10 | 2.5 | 5.0 | 15 | 18 |
| 20 | 2.0 | 5.0 | 14 | 18 |
| 30 | 1.5 | 5.0 | 14 | 18 |
| 60 | 2.0 | 5.0 | 15 | 18 |

Discussion

1. Pupil Size: Pilocarpine (a muscarinic agonist) induces miosis (pupil constriction). In contrast, Atropine, an antimuscarinic agent, would produce mydriasis (pupil dilation).

2. Intraocular Pressure: Pilocarpine and Timolol reduce IOP, beneficial for glaucoma management. Adrenaline may transiently increase IOP via alpha-adrenergic stimulation.

3. Corneal Reflex: A preserved corneal reflex suggests minimal or no neurotoxic effect of the test drug on the cornea.

4. Additional Observations: Monitor for signs such as conjunctival redness, tearing (lacrimation), or discomfort indicating irritation or side effects.

Precautions

- Adhere to ethical guidelines for animal experimentation.
- Ensure sterility during drug administration to prevent infections.
- Properly handle and dispose of all biological and chemical waste.

