AIM: Effects of skeletal muscle relaxants using Rota-rod apparatus.

REFERENCE:

1) M.N. Gosh Common Laboratory Animals, Fundamentals of Experimental Pharmacology, Fifth Edition, 2011
2) Kulkarni S.K., Handbook of experimental pharmacology, New Delhi: Vallabh Prakashan, 2014.

INTRODUCTION:

Diazepam, a member of the benzodiazepine class of drugs, is widely used for its antianxiety and muscle relaxant properties. The study of these properties, particularly the muscle relaxant effect, is crucial in understanding the drug's therapeutic potential. This experiment aims to investigate the muscle relaxant properties of Diazepam, specifically its effect on muscle grip strength, using a Rota-Rod apparatus in mice.

REQUIREMENTS:

Apparatus: Rota-Rod Apparatus, weight machine, syringe, Mice Cage

Animal: Mice (20-30 gm)

Drugs: Diazepam (0.4 mg/ml)

PRINCIPLE:

The principle of this experiment lies in the pharmacological action of Diazepam. The drug induces muscle relaxation along with a calming effect, which helps reduce anxiety and tension. The loss of muscle grip, as observed when a mouse falls from the rotating rod of the Rota-Rod apparatus, is an indication of muscle relaxation. The time taken by the animal to fall from the rotating rod is taken as an index of muscle relaxation.

OBSERVATION TABLE:

Sr No.	Body Wt. (gm)	Treatment	Fall off time (sec)		% decrease in time
			Before Drug	After Drug	
1.					
2.					
3.					
4.					
5.					
		Average			

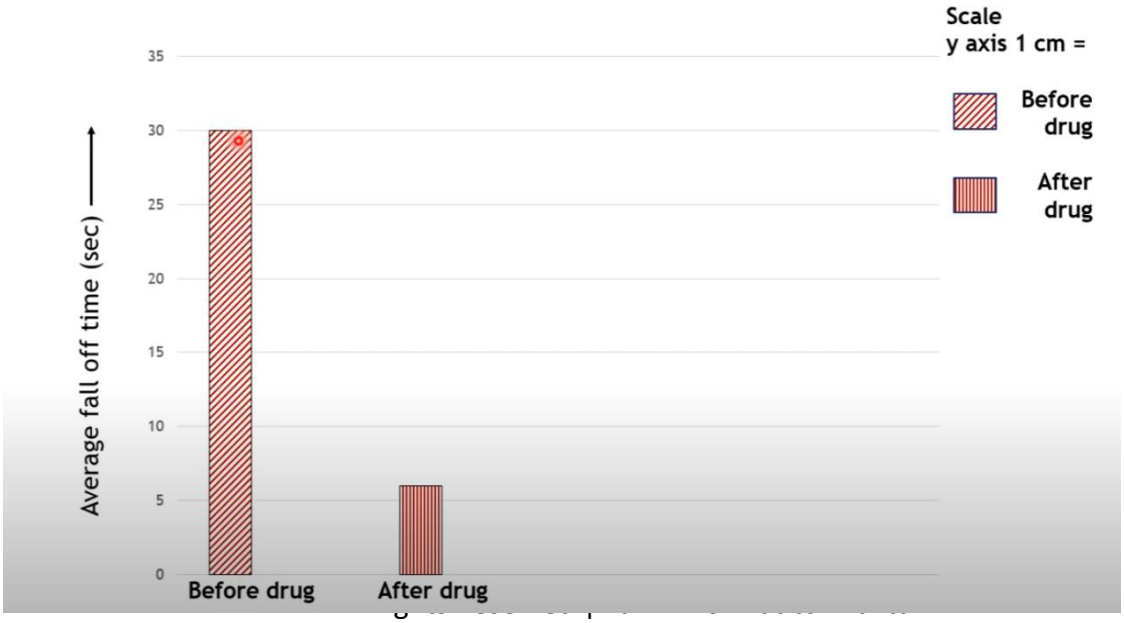
INFERENCE:

Sr No.	Body Wt. (gm)	Treatment	Fall off time (sec)		% decrease in time
			Before Drug	After Drug	
1.	20	Diazepam	66	5	92.42
2.	22	Diazepam	60	7	88.33
3.	25	Diazepam	61	8	86.89
4.	20	Diazepam	62	5	91.93
5.	23	Diazepam	63	6	90.47
		Average	62.4	6.2	

*Observation table after completion of the experiment can be downloaded by clicking tab (RJPT SimLab)

DISCLAIMER: "The results provided here are only for reference or comparison purposes. Students are expected to perform the experiment and record their actual observations."

GRAPH:



PROCEDURE:

1. Organize the mice into groups of six.
2. Assign a number to each mouse after weighing them.
3. Activate the Rota-rod Apparatus and set the speed to an optimal range of 20-25 rpm.
4. Place each mouse on the rotating rod one after the other. The apparatus has six compartments, so each mouse should be in its own compartment.
5. Record the 'fall off time' (the time when the mouse falls from the rotating rod). After this, switch off the Rota-rod apparatus and return all mice to their original cage.
6. Select each mouse, administer the drug via a syringe, and then move it to the empty cage. Dispose of the used syringe in the trash bin after each application.
7. Allow a waiting period of 30 minutes.
8. Reactivate the Rota-rod Apparatus and maintain the speed within the 20-25 rpm range.
9. Once again, place each mouse on the rotating rod in a sequential manner, ensuring each one is in its own compartment.
10. Record the 'fall off time' again and switch off the Rota-rod apparatus. Return all mice to their original cage.
11. Analyse and compare the 'fall off time' of the mice before and after the diazepam treatment.

RESULTS:

The outcome of this experiment will show how Diazepam affects muscle relaxation. If the mice take shorter to fall off the rotating rod after being given Diazepam, it shows that the drug has a muscle relaxant effect. However, the results can vary based on the specific conditions of the experiment and the individual responses of the mice.