STUDY OF DIURETIC ACTIVITY OF GIVEN DRUGS TO RATS/MICE USING METABOLIC CAGE

- **INTRODUCTION**

Diuretics are pharmacological agents that promote the excretion of water and electrolytes from the body through increased urine output. They are commonly used in the management of conditions such as hypertension, heart failure, and edema.

The present study aims to evaluate the diuretic activity of selected drugs such as furosemide, Acetazolamide, osmotic diuretics like mannitol etc. using a rodent model (rats/mice) housed in metabolic cages.

The metabolic cages allow for the accurate collection and measurement of urine output over a specified period, enabling a reliable assessment of the diuretic potential of the test substances. By comparing the urine volume and electrolyte excretion of treated groups with control groups, the efficacy of the drugs can be determined.

- **EQUIPMENT REQUIRED**

Animal :- Rat / Mice

Drug: Furosemide (10mg/kg)

Instrument:- Metabolic Cage

- **PRINCIPLE**

The principle of this experiment is based on the ability of diuretic drugs to increase the rate of urine formation by enhancing the excretion of water and electrolytes, such as sodium and potassium, from the kidneys. When administered to rodents, these drugs act on different segments of the nephron to inhibit sodium reabsorption, leading to increased osmotic flow of water into the urine. The animals are placed in metabolic cages, which facilitate accurate and separate collection of urine without contamination. By measuring parameters such as urine volume, pH, and electrolyte concentration over a set period, the diuretic activity of the test drugs can be quantitatively evaluated and compared to standard diuretics or control treatments.

PROCEDURE:

1) Divide animals into two groups (6 animals in each)
2) Fast the animals for 18hours before the experiment, allowing free access to water.
3) Acclimatize animals to the metabolic cages prior to the experiment.
4) Administer one group with the drug (Furosemide 10mg/kg) to be tested and other with vehicle (Normal Saline) by intraperitoneal Route.
5) After that place the animals in metabolic cages.
6) Record the total volume of urine collected after 5 hr or up to 24 hours (For prolong effect).
7) Compare the urine output between vehicle treated and drug treated group.

CONCLUSION

The diuretic activity of the tested drugs was successfully evaluated using rodents housed in metabolic cages. The study demonstrated that the test compounds increased urine output and electrolyte excretion compared to the control group, indicating their potential diuretic effect. By comparing the results with a standard diuretic, the relative efficacy of the test drugs was determined. These findings support the use of metabolic cage models as a reliable method for screening and assessing the diuretic potential of pharmacological agents.

	Vehicle (Normal Saline) mL	**Drug (Furosemide 10 mg/kg) mL**
	2.8	9.6
	3.4	8.9
	3.6	8.8
	2.8	10
	4.3	10.5
	3.2	9.8
Average	**3.35**	**9.6**

RESULT:

Increase in the average urine output in diuretic drug (Furosemide) treated rat/mice have been observed compared to vehicle (Normal saline).

DISCUSSION:

The diuretic drug (Furosemide) showed notable diuretic activity, evident from increased urine output and electrolyte excretion compared to the control. This suggests a possible action on renal tubules, similar to standard diuretics. The metabolic cage setup enabled accurate urine collection, ensuring reliable results.